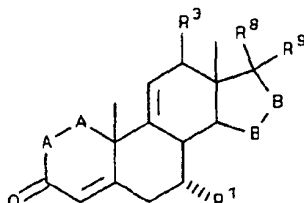


399

WHAT IS CLAIMED IS:

1. A process for the preparation of a compound of Formula II:



II

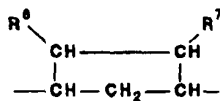
wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxy carbonyl, cyano and aryloxy;

- 10 R¹ represents an alpha-oriented lower alkoxy carbonyl or hydroxycarbonyl radical;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

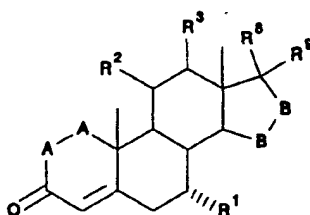
- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

400

- 20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;
- 25

the process comprising:

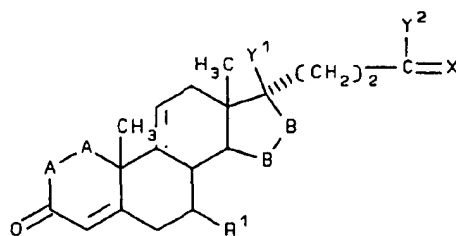
- removing an 11α -leaving group from a compound of Formula IV:
- 30



IV

- wherein -A-A-, -B-B-, R^1 , R^3 , R^8 , and R^9 are as defined above, and R^2 is a leaving group the abstraction of which is effective for generating a double bond between the 9- and 11-carbon atoms.
- 35

2. A process as set forth in claim 1 wherein said compound of Formula II corresponds to Formula IIAA:



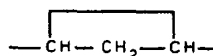
IIAA

wherein:

401

5 -A-A- represents the group $-\text{CH}_2-\text{CH}_2-$ or $-\text{CH}=\text{CH}-$;

-B-B- represents the group $-\text{CH}_2-\text{CH}_2-$ or an alpha- or beta- oriented group of Formula IIIA:



IIIA

10 R^1 represents an alpha-oriented lower alkoxy carbonyl radical;

X represents two hydrogen atoms or oxo;

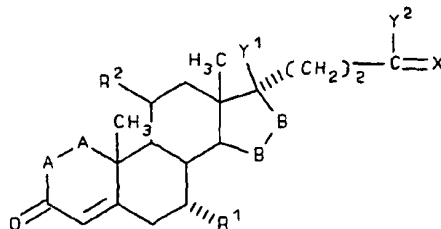
Y^1 and Y^2 together represent the oxygen bridge $-\text{O}-$,
or

Y^1 represents hydroxy, and

15 Y^2 represents hydroxy, lower alkoxy or, if X represents H_2 , also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y^2 represents hydroxy, the process comprising:

20 contacting a solution comprising a lower alkanolic acid and a salt of a lower alkanolic acid with a compound corresponding to Formula IVAA:



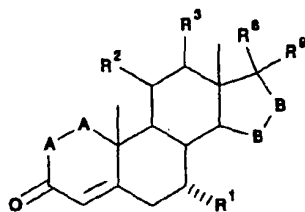
IVAA

wherein -A-A-, -B-B-, R^1 , X, Y^1 and Y^2 are as defined in Formula IIAA, and R^2 is lower alkylsulfonyloxy or acyloxy.

402

3. A process as set forth in claim 1 wherein said compound of Formula IV is Methyl Hydrogen 17 α -Hydroxy-11 α -(methylsulfonyl)oxy-3-oxopregn-4-ene-7 α ,21-dicarboxylate, γ -Lactone and said compound of Formula II
 5 is Methyl Hydrogen 17 α -Hydroxy-3-oxopregna-4,9(11)-diene-7 α ,21-dicarboxylate, γ -Lactone.

4. A process for the preparation of a compound of Formula IV:



IV

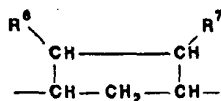
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxy carbonyl, cyano and aryloxy;

10 R¹ represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy,

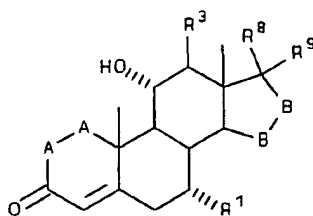
403

acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

- 20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring; and
- 25 R^2 is lower alkylsulfonyloxy or acyloxy or a halide;

the process comprising:

- 30 reacting a lower alkylsulfonylating or acylating reagent or a halide generating agent such as thionyl halide, sulfur halide, or oxalyl halide with a compound of Formula V

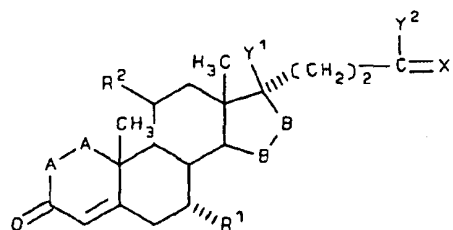


V

- 35 wherein -A-A-, -B-B-, R^1 , R^3 , R^8 , and R^9 are as defined above.

5. A process as set forth in claim 4 wherein said compound of Formula IV corresponds to Formula IVAA:

404



IVAA

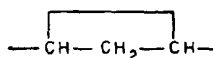
wherein:

5 -A-A- represents the group -CH₂-CH₂- or -CH=CH-;

R¹ represents an alpha-oriented lower alkoxycarbonyl radical;

R² represents lower alkylsulfonyloxy or acyloxy;

10 -B-B- represents the group -CH₂-CH₂- or an alpha- or beta- oriented group:



IIIA

X represents two hydrogen atoms or oxo;

Y¹ and Y² together represent the oxygen bridge -O-, or

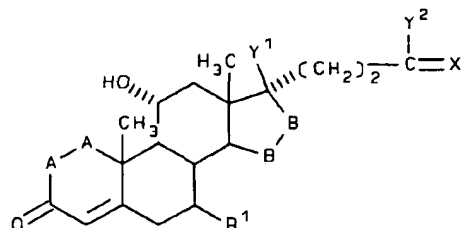
15 Y¹ represents hydroxy, and

Y² represents hydroxy, lower alkoxy or, if X represents H₂, also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y² represents hydroxy, the process comprising:

405

- 20 reacting a lower alkylsulfonyl or acyl halide in the presence of a hydrogen halide scavenger with a compound corresponding to the formula:

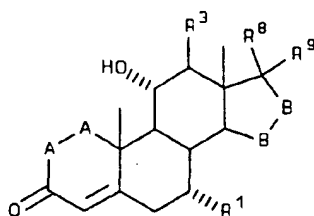


VAA

- 25 wherein -A-A-, -B-B-, R^1 , X, Y^1 , and Y^2 are as defined in Formula IVAA.

6. A process as set forth in claim 4 wherein said compound of Formula IV is Methyl Hydrogen 17 α -Hydroxy-11 α -(methylsulfonyl)oxy-3-oxopregn-4-ene-7 α ,21-dicarboxylate, γ -Lactone and said compound of Formula V
5 is Methyl Hydrogen 11 α ,17 α -Dihydroxy-3-oxopregn-4-ene-7 α ,21-dicarboxylate, γ -Lactone.

7. A process for the preparation of a compound of Formula V:



V

wherein

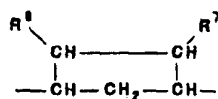
- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower

alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 R^1 represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical;

-B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:



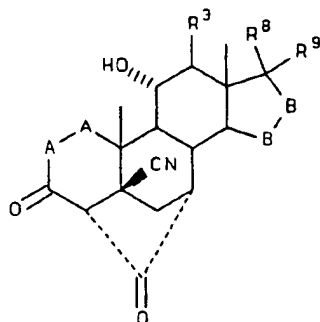
III

- 15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and
- 20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic
- 25 or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

- 30 reacting a compound of Formula VI with an alkali metal alkoxide corresponding to the formula $R^{10}OM$ wherein M is alkali metal and $R^{10}O-$ corresponds to the alkoxy substituent of R^1 , said compound of Formula VI having the structure:

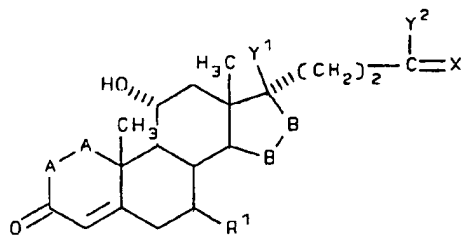
407



VI

35 wherein -A-A-, -B-B-, R^3 , R^8 , and R^9 are as defined above.

8. A process as set forth in claim 7 wherein the compound of Formula VA corresponds to the formula:



VAA

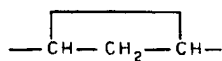
wherein

5 -A-A- represents the group $-\text{CH}_2-\text{CH}_2-$ or $-\text{CH}=\text{CH}-$;

R^1 represents an alpha-oriented lower alkoxycarbonyl radical;

-B-B- represents the group $-\text{CH}_2-\text{CH}_2-$ or an alpha- or beta- oriented group:

10



IIIA

X represents two hydrogen atoms or oxo;

Y^1 and Y^2 together represent the oxygen bridge $-\text{O}-$,
or

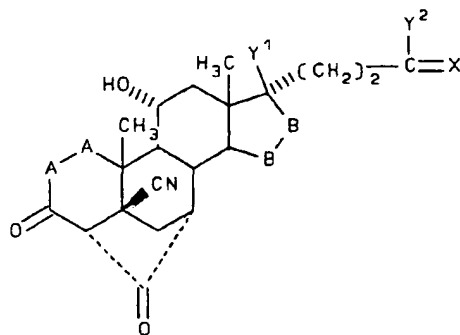
408

Y^1 represents hydroxy, and

- 15 Y^2 represents hydroxy, lower alkoxy or, if X represents H_2 , also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y^2 represents hydroxy, the process comprising:

- 20 reacting a compound of Formula VIAA with an alkali metal alkoxide corresponding to the formula $R^{10}OM$ in the presence of an alcohol having the formula $R^{10}OH$, wherein M is alkali metal and $R^{10}O^-$ corresponds to the alkoxy substituent of R^1 , said compound of Formula VIAA having the structure:



25

VIAA

wherein -A-A-, -B-B-, Y^1 , Y^2 and X are as defined in Formula VAA.

9. A process as set forth in claim 7 wherein the compound of Formula V is Methyl Hydrogen $11\alpha,17\alpha$ -Dihydroxy-3-oxopregn-4-ene- $7\alpha,21$ -dicarboxylate, γ -Lactone and the compound of Formula VI is $4'S(4'\alpha),7'\alpha$ -
 5 Hexadecahydro- $11'\alpha$ -hydroxy- $10'\beta,13'\beta$ -dimethyl- $3',5,20'$ -trioxospiro[furan-2(3H), $17'\beta$ -[4,7]methano[17H]cyclopenta[a]phenanthrene]- $5'\beta(2'H)$ -carbonitrile.

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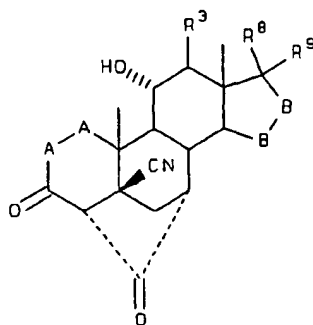
10. A process as set forth in claim 7 wherein cyanide ion is formed as a by-product of the reaction, the process further comprising removal of cyanide ion from the reaction zone during the reaction to reduce the extent of any reaction of cyanide ion with the product of Formula V.

11. A process as set forth in claim 10 wherein cyanide ion is removed from the reaction by precipitation with a precipitating agent.

12. A process as set forth in claim 11 wherein said reaction is carried out in a solvent medium, and said precipitating agent comprises a salt comprising a cation which forms a cyanide compound of lower solubility in said medium than the solubility of the precipitating agent therein.

13. A process as set forth in claim 12 wherein said cation is selected from the group consisting of alkaline earth metal ions and transition metal ions.

14. A process for the preparation of a compound of Formula VI:



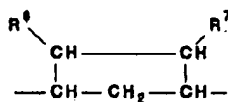
VI

wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

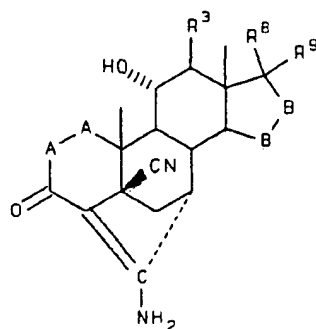
15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic
25 ring structure fused to the pentacyclic D ring;

the process comprising:

hydrolyzing a compound corresponding to Formula VII:

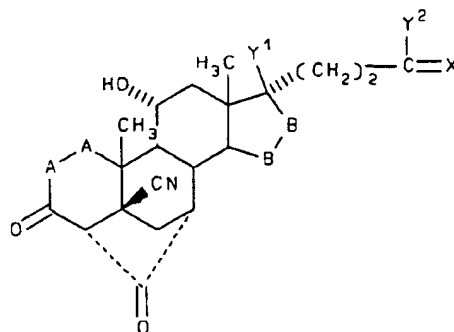
411



VII

wherein -A-A-, -B-B-, R^3 , R^8 , and R^9 are as defined above.

15. A process as set forth in claim 14 wherein said compound of Formula VI corresponds to the formula:

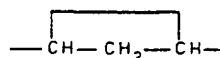


VIAA

wherein:

5 -A-A- represents the group $-\text{CH}_2-\text{CH}_2-$ or $-\text{CH}=\text{CH}-$;

-B-B- represents the group $-\text{CH}_2-\text{CH}_2-$ or an alpha- or beta- oriented group:



IIIA

X represents two hydrogen atoms or oxo;

10 Y^1 and Y^2 together represent the oxygen bridge $-\text{O}-$,
or

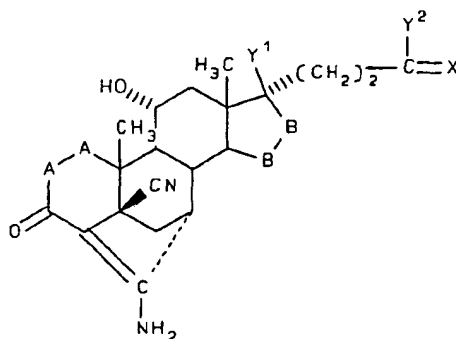
412

Y^1 represents hydroxy, and

Y^2 represents hydroxy, lower alkoxy or, if X represents H_2 , also lower alkanoyloxy;

- 15 and salts of compounds in which X represents oxo and Y^2 represents hydroxy, the process comprising:

hydrolyzing a compound of Formula VIIAA in the presence of an acid and an organic solvent and/or water, said compound of Formula VIIAA having the structure:



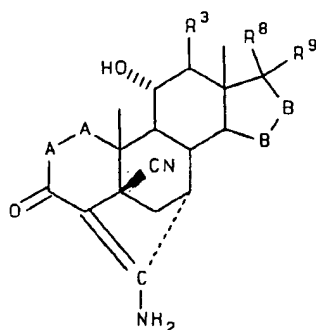
VIIAA

wherein -A-A-, -B-B-, Y^1 , Y^2 , and X are as defined in Formula VIAA.

16. A process as set forth in claim 14 wherein said compound of Formula VI is 4'S(4' α), 7' α -Hexadecahydro-11' α -hydroxy-10' β , 13' β -dimethyl-3', 5, 20'-trioxospiro [furan-2(3H), 17' β -[4, 7]methano[17H]cyclopenta[a]phenanthrene]-5' β (2'H)-carbonitrile and said compound of
- 5 Formula VII is 5'R(5' α), 7' β -20'-Aminohexadecahydro-11' β -hydroxy-10' α , 13' α -dimethyl-3', 5-dioxospiro[furan-2(3H), 17' α (5'H)-[7, 4]metheno[4H]cyclopenta[a]phenanthrene]-5'-carbonitrile.

17. A process for the preparation of a compound of Formula VII:

413



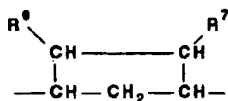
VII

wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

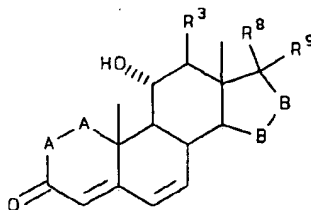
- 20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together

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25 with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

reacting a compound of Formula VIII with a source of cyanide ion in the presence of an alkali metal salt, said compound of Formula VIII having the structure:

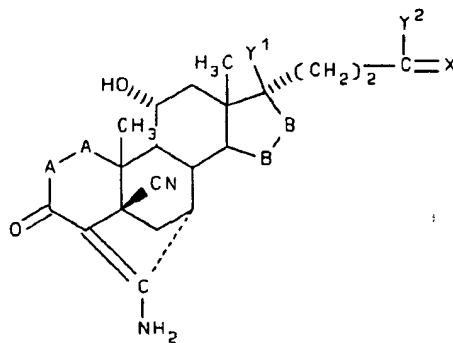


30

VIII

wherein -A-A-, -B-B-, R^3 , R^8 , and R^9 are as defined above.

18. A process as set forth in claim 17 wherein said compound of Formula VII corresponds to Formula VIIIAA:



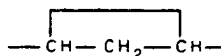
VIIIAA

wherein:

5 -A-A- represents the group $-CH_2-CH_2-$ or $-CH=CH-$;

-B-B- represents the group $-CH_2-CH_2-$ or an alpha- or beta- oriented group:

415



IIIA

X represents two hydrogen atoms or oxo;

10 Y¹ and Y² together represent the oxygen bridge -O-,
or

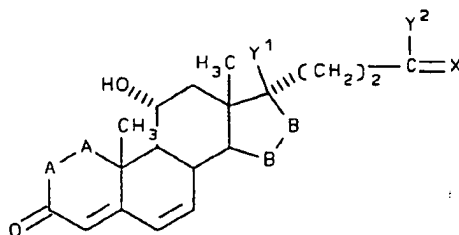
Y¹ represents hydroxy, and

Y² represents hydroxy, lower alkoxy or, if X
represents H₂, also lower alkanoyloxy;

15 and salts of compounds in which X represents oxo and Y²
represents hydroxy, the process comprising:

reacting a cyanide source such as ketone cyanohydrin in
the presence of an alkali metal salt such as LiCl and in
the presence of a base with an 11 α -hydroxy compound

20 corresponding to the formula:



VIII A

wherein -A-A-, -B-B-, Y¹, Y², and X are as defined in
Formula VII A.

19. A process as set forth in claim 17 wherein said
compound of Formula VII is 5'R(5' α), 7' β -20'-
Aminohexadecahydro-11' β -hydroxy-10' α , 13' α -dimethyl-3', 5-
dioxospiro[furan-2(3H), 17' α (5'H) - [7, 4]metheno

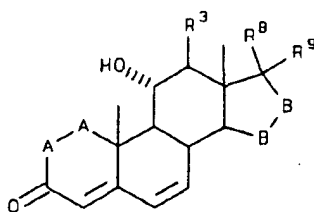
5 [4H]cyclopenta[a]phenanthrene]-5'-carbonitrile and said

416

compound of Formula VIII is 11 α ,17 α -Dihydroxy-3-oxopregna-4,6-diene-21-carboxylic Acid, γ -Lactone.

20. A process as set forth in claim 17 wherein said source of cyanide ion comprises an alkali metal cyanide, the reaction between said compound of Formula VIII and cyanide ion being carried out in the presence of an acid and water.

21. A process for the preparation of a compound of Formula VIII



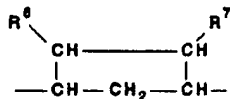
VIII

wherein

-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

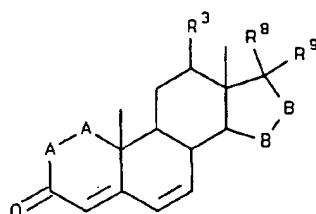
417

alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy; and

20 R^8 and R^9 are independently selected from the group
consisting of hydrogen, hydroxy, halo, lower alkoxy,
acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,
alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy, or R^8 and R^9 together comprise a carbocyclic
or heterocyclic ring structure, or R^8 and R^9 together
25 with R^6 or R^7 comprise a carbocyclic or heterocyclic
ring structure fused to the pentacyclic D ring;

the process comprising:

oxidizing a substrate compound corresponding to Formula
XIII by fermentation in the presence of a microorganism
effective for introducing an 11-hydroxy group into said
30 substrate in α -orientation, said substrate corresponding
to the formula:



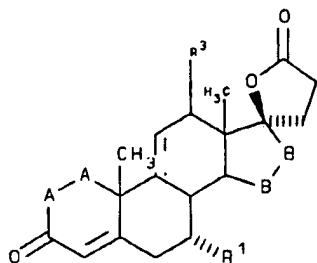
XIII

wherein -A-A-, -B-B-, R^1 , R^3 , R^8 , and R^9 are as defined
above.

22. A process as set forth in claim 21 wherein said
compound of Formula VIII is 11 α ,17 α -Dihydroxy-3-
oxopregna-4,6-diene-21-carboxylic Acid, γ -Lactone.

23. A process for the preparation of a mexrenone
derivative corresponding to the formula:

418



XXXI

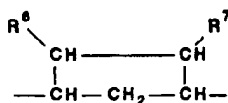
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R¹ represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

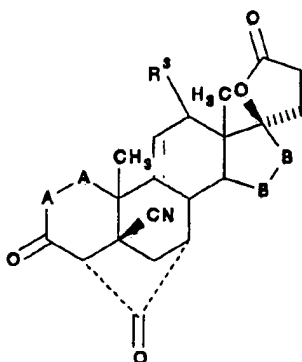
15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

20 the process comprising:

reacting a compound of Formula XIVB with an alkali metal alkoxide corresponding to the formula R¹⁰OM wherein M is

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alkali metal and $R^{10}O^-$ corresponds to the alkoxy
 substituent of R^1 , said compound of Formula XIVB having
 25 the structure:

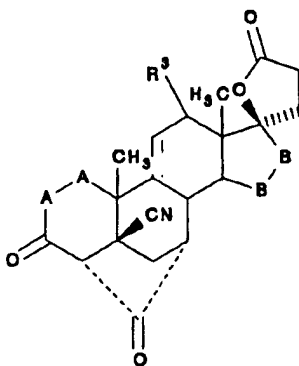


XIVB

wherein -A-A-, -B-B- and R^3 are as defined above.

24. A process as set forth in claim 23 wherein said
 compound of Formula XIV is 4'S(4'α),7'α-1',2',3',
 4,4',5,5',6',7',8',10',12',13',14',15',16'-hexadecahydro-
 10β-,13'β-dimethyl-3',5,20'-trioxospiro[furan-2(3H),17'β-
 5 [4,7]methano[17H]cyclopenta[a]phenanthrene]5'-
 carbonitrile.

25. A process for the preparation of a compound of
 Formula XIVB:



XIVB

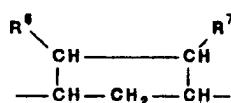
wherein

420

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

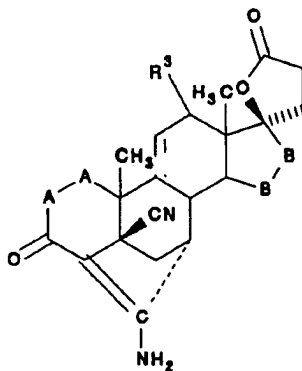


III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

hydrolyzing a compound corresponding to Formula XVB:



XVB

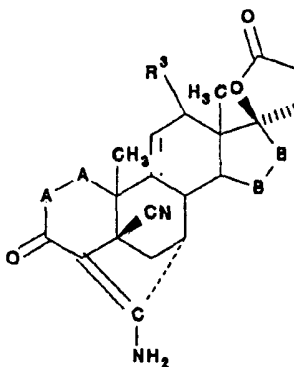
20

wherein -A-A-, -B-B- and R^3 are as defined above.

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26. A process as set forth in claim 25 wherein said compound of Formula XIV is 4'S(4'α), 7'α-1', 2', 3', 4, 4', 5, 5', 6', 7', 8', 10', 12', 13', 14', 15', 16'-hexadecahydro-10β-, 13'β-dimethyl-3', 5, 20'-trioxospiro[furan-2(3H), 17'β-
 5 [4, 7]methano[17H]cyclopenta[a]phenanthrene]5'-carbonitrile and said compound of Formula XV is 5'R(5'α), 7'β-20'-amino-1', 2', 3', 4, 5, 6', 7', 8', 10', 12', 13', 14', 15', 16'-tetradecahydro-10'α, 13'α-dimethyl-3', 5-dioxospiro[furan-2(3H), 17'α(5'H) - [7, 4]metheno[4H] -
 10 cyclopenta[a]phenanthrene] - 5' - carbonitrile.

27. A process for the preparation of a compound corresponding to Formula XVB:



XVB

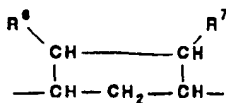
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:

422

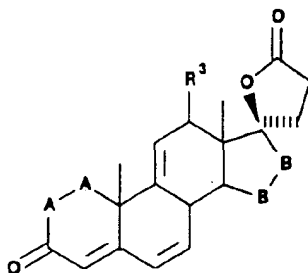


III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 reacting a compound of Formula XVI with a source of cyanide ion in the presence of an alkali metal salt, said compound of Formula XVI having the structure:



XVI

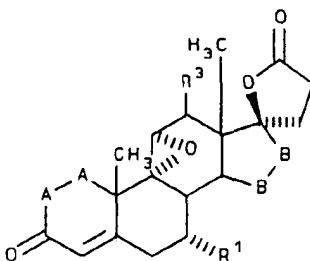
wherein -A-A-, -B-B- and R³ are as defined above.

28. A process as set forth in claim 27 wherein said compound of Formula XVB is 5'R(5'α),7'β-20'-amino-1',2',3',4,5,6',7',8',10',12',13',14',15',16'-tetradecahydro-10'α,13'α-dimethyl-3',5-dioxospiro[furan-2(3H),17'α(5'H)-[7,4]metheno[4H]-cyclopenta[a]phenanthrene]-5'-carbonitrile.

5

29. A process for the preparation of a compound corresponding to the formula:

423



XXXII

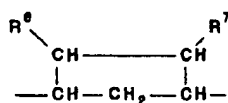
wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 R¹ represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

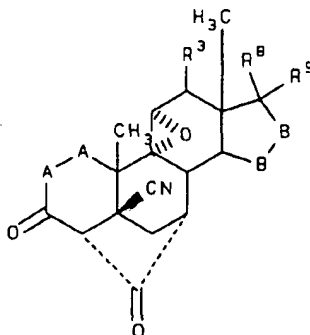
- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

- 20 the process comprising:

reacting a compound of Formula XXI with an alkali metal alkoxide corresponding to the formula R¹⁰OM wherein M is

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alkali metal and $R^{10}O^-$ corresponds to the alkoxy
 substituent of R^1 , said compound of Formula XXI having the
 25 structure:



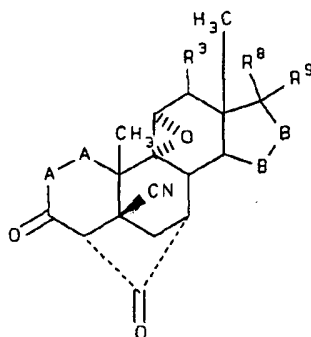
XXI

wherein -A-A-, -B-B-, R^1 and R^3 are as defined above; and
 R^8 and R^9 are independently selected from the group
 consisting of hydrogen, hydroxy, halo, lower alkoxy,
 30 acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl,
 alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and
 R^9 together comprise a carbocyclic or heterocyclic ring
 structure, or R^8 and R^9 together with R^6 or R^7 comprise a
 carbocyclic or heterocyclic ring structure fused to the
 35 pentacyclic D ring.

30. A process as set forth in claim 29 wherein said
 compound of Formula XXI is 4'S(4'α),7'α-9',11α-
 epoxyhexadecahydro-10β-,13'β-dimethyl-3'5,20'-
 trioxospiro[furan-2(3H),17'β-[4,7]methano[17H]
 5 cyclopenta[a]phenanthrene-5'-carbonitrile.

31. A process for the preparation of a compound
 corresponding to Formula XXI:

425



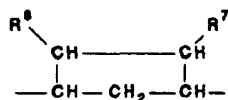
XXI

wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

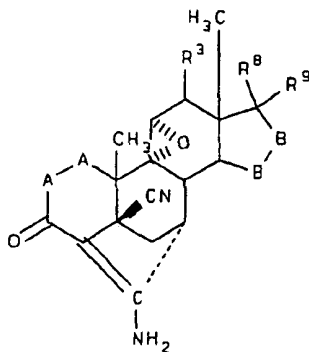
- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

- 20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ and R⁹ together

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- with R⁶ or R⁷ comprise a carbocyclic or heterocyclic
 25 ring structure fused to the pentacyclic D ring;
 the process comprising:

hydrolyzing a compound corresponding to Formula XXII:



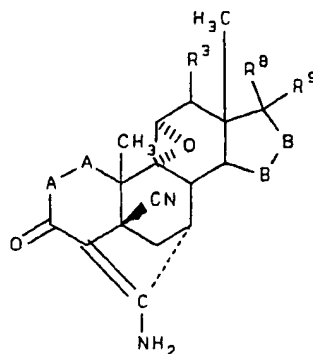
XXII

wherein -A-A-, -B-B-, R³, R⁸ and R⁹ are as defined above.

32. A process as set forth in claim 31 wherein said
 compound of Formula XXI is 4'S(4'α),7'α-9',11α-
 epoxyhexadecahydro-10β-,13'β-dimethyl-3'5,20'-
 trioxospiro[furan-2(3H),17'β-[4,7]methano[17H]
 5 cyclopenta[a]phenanthrene-5'-carbonitrile and said
 compound of Formula XXII is 5'R(5'α),7'β-20'-amino-9,11β-
 epoxyhexadecahydro-10',13'-dimethyl-3',5-dioxospiro
 [furan-2(3H),17'a(5'H)-[7,4]methene[4H]cyclopenta[a]
 phenanthrene-5'-carbonitrile.

33. A process for the preparation of a compound
 corresponding to Formula XXII:

427



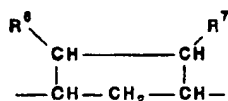
XXII

wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

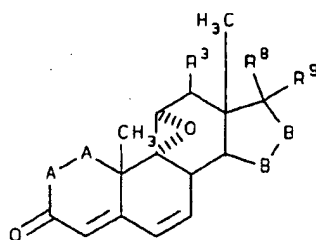
20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic

428

or heterocyclic ring structure, or R^8 and R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

reacting a compound of Formula XXIII with a source of cyanide ion in the presence of an alkali metal salt, said compound of Formula XXIII having the structure:

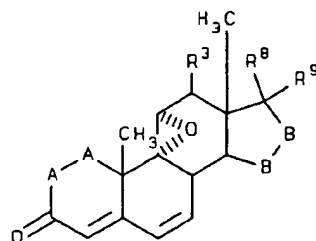


XXIII

wherein -A-A-, -B-B-, R^3 , R^8 and R^9 are as defined above.

34. A process as set forth in claim 33 wherein said compound of Formula XXII is 5'R(5' α), 7' β -20'-amino-9,11 β -epoxyhexadecahydro-10',13'-dimethyl-3',5-dioxospiro [furan-2(3H), 17'a(5'H) - [7,4]methene[4H]cyclopenta[a]phenanthrene-5'-carbonitrile and said compound of Formula XXIII is 9,11 α -epoxy-17 α -hydroxy-3-oxopregna-4,6-diene-21-carboxylic acid, γ -lactone.

35. A process for the preparation of a compound corresponding to Formula XXIII:



XXIII

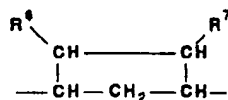
wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^1 represents an alpha-oriented lower alkoxycarbonyl radical;

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

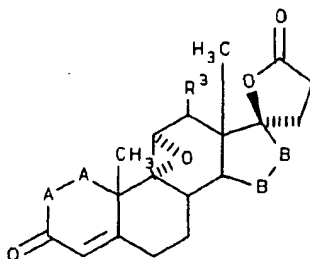
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 and R^9 together
25 with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

abstracting hydrogen from the 6 and 7 positions of a compound corresponding to the formula:

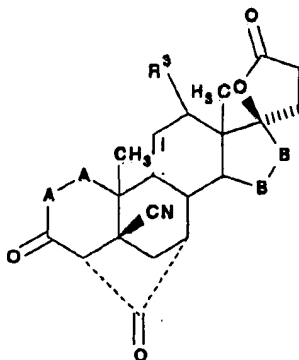
430



XXIV

wherein -A-A-, -B-B-, R^3 , R^8 and R^9 are as defined above.

36. A process for the preparation of a compound of Formula XIVB:



XIVB

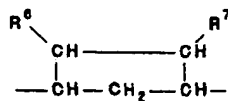
wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

431

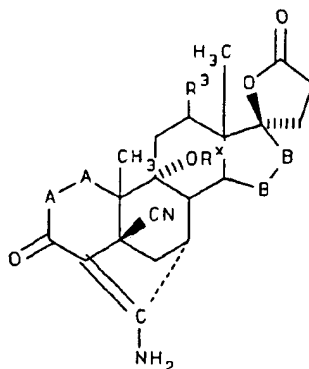


III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

hydrolyzing a compound corresponding to Formula XXV:



XXV

20

wherein R^{*} is a hydroxy protecting group; and

wherein -A-A-, -B-B- and R³ are as defined above.

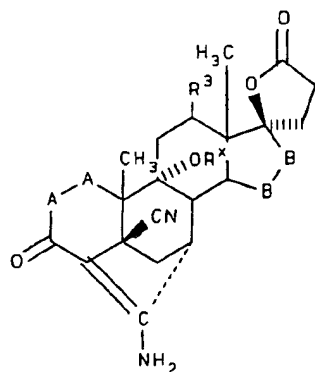
37. A process as set forth in claim 36 wherein said compound of Formula XIV is 4'S(4'α),7'α-1',2',3',4,4',5,5',6',7',8',10',12',13',14',15',16'-hexadecahydro-10β-,13'β-dimethyl-3',5,20'-trioxospiro[furan-2(3H),17'β-[4,7]methano[17H]cyclopenta[a]phenanthrene]5'-carbonitrile and said compound of Formula XXV is 5'R(5'α),7'β-20'-aminohexadecahydro-9'β-hydroxy-10'a,13'α-dimethyl-3',5-dioxospiro[furan-2(3H),17'α(5'H)-

5

432

10 [7,4]metheno[4H]cyclopenta[a]phenanthrene]-5'-
carbonitrile.

38. A process for the preparation of a compound
corresponding to Formula XXV:



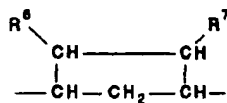
XXV

wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³, R⁴ and R⁵ are independently selected from the
group consisting of hydrogen, halo, hydroxy, lower
alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl,
hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha-
or beta- oriented group:



III

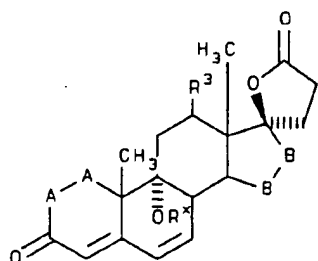
15 where R⁶ and R⁷ are independently selected from the
group consisting of hydrogen, halo, lower alkoxy,
acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,
alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and
aryloxy;

433

where R^* is a hydroxy protecting group,

the process comprising:

- 20 reacting a compound of Formula XXVI with a source of cyanide ion in the presence of an alkali metal salt, said compound of Formula XXVI having the structure:

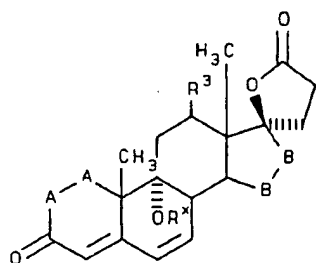


XXVI

wherein -A-A-, -B-B- and R^3 are as defined above.

39. A process as set forth in claim 38 wherein said compound of Formula XXV is 5'R(5' α), 7' β -20'-aminohexadecahydro-9' β -hydroxy-10'a, 13' α -dimethyl-3', 5-dioxospiro[furan-2(3H), 17' α (5'H) - [7,4]metheno
5 [4H]cyclopenta[a]phenanthrene]-5'-carbonitrile and said compound of Formula XXVI is 9 α , 17 α -dihydroxy-3-oxopregna-4,6-diene-21-carboxylic acid, γ -lactone.

40. A process for the preparation of a compound corresponding to Formula XXVI:



XXVI

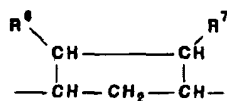
wherein

434

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



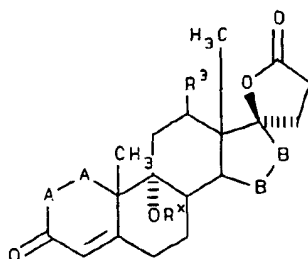
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

where R^x is a hydroxy protecting group;

the process comprising:

20 abstracting hydrogens from the 6 and 7 positions (dehydrogenation) of a compound corresponding to the formula:



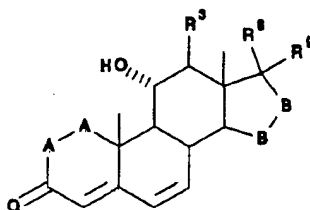
XXVII

wherein -A-A-, -B-B- and R^3 are as defined above.

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41. A process as set forth in claim 40 wherein said compound of Formula XXVI is 9 α ,17 α -dihydroxy-3-oxopregna-4,6-diene-21-carboxylic acid, γ -lactone and said compound of Formula XXVII is 9 α ,17 α -dihydroxy-3-oxopregn-4-ene-21-carboxylic acid, γ -lactone.

42. A process for the preparation of a compound corresponding to Formula VIII:



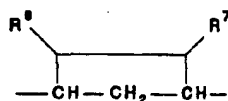
VIII

wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

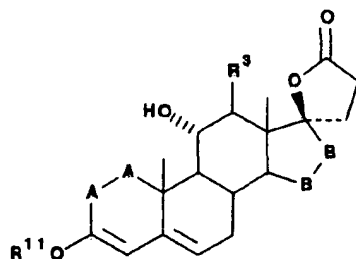
15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

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20 R^8 and R^9 are independently selected from the group
 consisting of hydrogen, hydroxy, halo, lower alkoxy,
 acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,
 alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
 aryloxy, or R^8 and R^9 together comprise a carbocyclic
 or heterocyclic ring structure, or R^8 and R^9 together
 25 with R^6 or R^7 comprise a carbocyclic or heterocyclic
 ring structure fused to the pentacyclic D ring;

the process comprising:

oxidizing a compound of Formula corresponding to
 Formula 104



[104]

30 wherein -A-A-, -B-B- and R^3 are as defined above and R^{11}
 is a C_1 to C_4 alkyl.

43. A process as set forth in claim 42 wherein the
 compound of Formula VIII is contacted with an oxidizing
 agent.

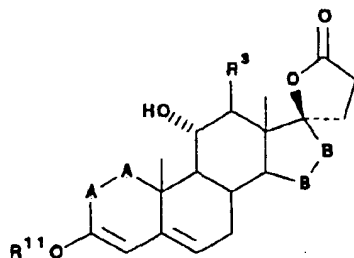
44. A process as set forth in claim 43 wherein said
 oxidizing agent is a benzoquinone derivative.

45. A process as set forth in claim 44 wherein said
 oxidizing agent is selected from the group consisting of
 2,3,-dichloro-5,6-dicyano-1,4-benzoquinone and
 tetrachlorobenzoquinone.

437

46. A process as set forth in claim 42 wherein said compound of Formula 104 is contacted with a halogenating agent to produce a halogenated intermediate; and contacting said halogenated intermediate with a
 5 dehydrohalogenating agent to dehydrohalogenate said halogenated intermediate and form said compound of Formula 104.

47. A process for the preparation of a compound corresponding to Formula 104:



104

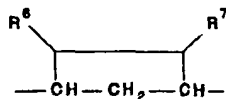
wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{11} is C_1 to C_4 lower alkyl; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



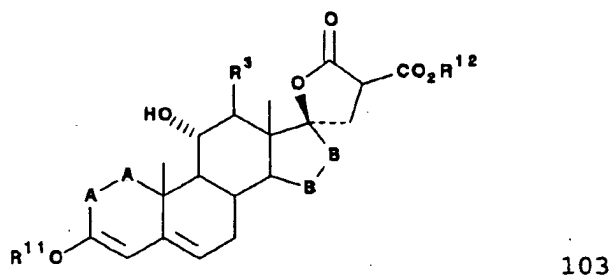
III

438

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

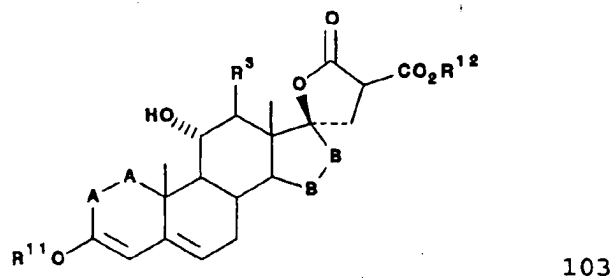
the process comprising:

20 thermally decomposing a compound corresponding to Formula 103 in the presence of an alkali metal halide, said compound of Formula 103 having the structure:



25 wherein -A-A-, -B-B- R³ and R¹¹ are as defined above, and R¹² is C₁-C₄ alkyl.

48. A process for the preparation of a compound corresponding to Formula 103:



wherein

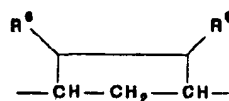
5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

439

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{11} is C_1 - C_4 lower alkyl; and

-B-B- represents the group - CHR^6 - CHR^7 - or an alpha- or beta- oriented group:

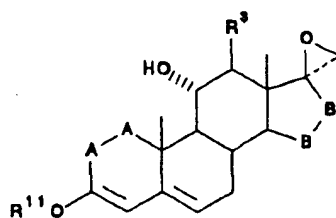


III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 condensing a compound of Formula 102 with a dialkyl malonate in the presence of a base, said compound of Formula 102 having the structure:

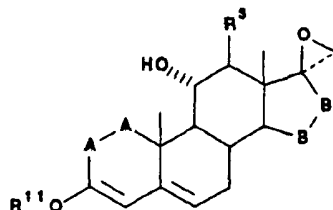


102

wherein -A-A-, -B-B-, R^3 and R^{11} are as defined above.

49. A process for the preparation of a compound corresponding to Formula 102:

440



102

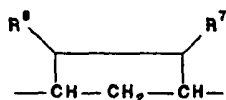
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R¹¹ is C₁ to C₄ alkyl; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



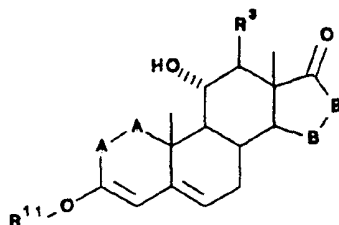
III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 reacting a compound of Formula 101 with a sulfonium ylide in the presence of a base, said compound of Formula 101 having the structure:

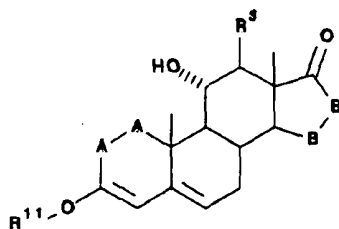
441



101

wherein -A-A-, -B-B- and R³ are as defined above.

50. A process for the preparation of a compound corresponding to Formula 101:



101

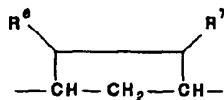
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R¹¹ is C₁-C₄ alkyl; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



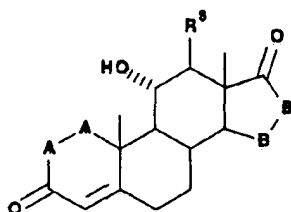
III

442

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

- 20 reacting a compound of Formula XXXVI with an etherifying reagent in the presence of an acid catalyst, said compound of Formula XXXVI having the structure:

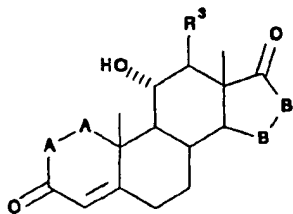


XXXVI

wherein -A-A-, -B-B- and R³ are as defined above.

51. A process as set forth in claim 50 wherein said compound of Formula 101 prepared by reacting a compound of Formula XXXVI with a trialkyl orthoformate in an acidified alkanol solvent.

52. A process for the preparation of a compound of Formula XXXVI



XXXVI

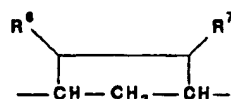
wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

443

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:

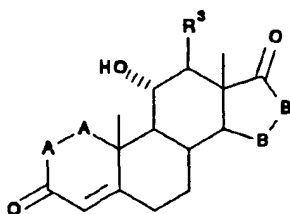


III

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

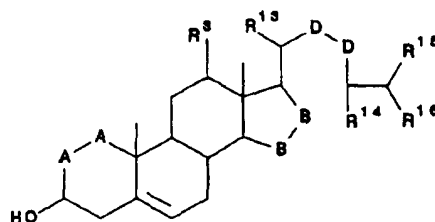
- 20 oxidizing a substrate compound of Formula XXXVII by fermentation in the presence of a microorganism effective for conversion of said substrate compound to a compound of Formula XXXVI



XXXVI

- 25 where -A-A-, -B-B- and R³ are as defined above, said substrate compound of Formula XXXVII corresponding to the Formula:

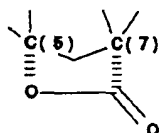
444



XXXVII

wherein -A-A-, -B-B- and R^3 and are as defined above; D-D is $-CH_2-CH_2-$ or $-CH=CH-$; and R^{13} , R^{14} , R^{15} , and R^{16} are
 30 independently selected from the group consisting of C_1-C_4 alkyl; and thereafter introducing an 11-hydroxy group into said α -orientation in said compound of Formula XXXVI by fermentation in the presence of a microorganism effective for the 11α -hydroxylation.

53. A process for the preparation of a 3-keto- 7α -alkoxycarbonyl substituted Δ -4,5-steroid comprising reacting an alkylating reagent with a 4,5-dihydro-5,7-lactone steroid substrate in the presence of a base, said
 5 lactone substrate being substituted with keto or dialkoxy at the 3-carbon, and further comprising the moiety:

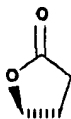


where C(5) represents the 5-carbon and C(7) represents the 7-carbon of the steroid structure of the substrate.

54. A process as set forth in claim 53 wherein said steroid substrate comprises a saturated or unsaturated nuclear structure further comprising:
 a 9,11-epoxide moiety or precursor thereto; and
 5 a substituent at the 17-carbon selected from the group consisting of spirolactone, keto, or other precursor to spirolactone.

445

55. A process as set forth in claim 54 wherein said steroid substrate and said steroid product are substituted at the 17-position with a spirolactone substituent corresponding to Formula XXXIII



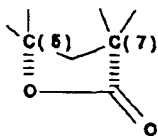
XXXIII.

56. A process as set forth in claim 53 comprising a 17-keto structure.

57. A process as set forth in claim 53 wherein said lactone substrate comprises 3-dialkoxy substituents.

58. A process as set forth in claim 53 wherein said 5,7-lactone is reacted with an alkyl halide in the presence of a base.

59. A process for the preparation of a 4,5-dihydro-5,7-lactone steroid compound, said lactone steroid being substituted with keto or dialkoxy at the 3-carbon, and comprising the moiety:



5

where C(5) represents the 5-carbon and C(7) represents the 7-carbon of the steroid structure of the lactone compound,

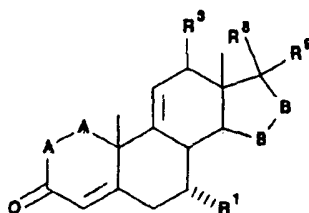
the process comprising:

446

- 10 converting a cyano substituted steroid to the 7-carboxylic acid, and thereafter converting the 7-carboxylic acid to the 5,7-lactone.

60. A process as set forth in claim 59 wherein the substrate comprises a 3-keto- Δ -4,5-7-carboxy steroid, and a ketal intermediate comprising a 3-dialkoxy-5,7-lactone is formed, said 3-dialkoxy-5,7-lactone being hydrolyzed
5 under the acidic conditions to form the 3-keto-5,7-lactone.

61. A process for the preparation of a compound corresponding to Formula II:



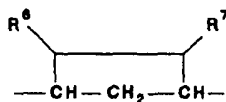
II

wherein

- 5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

- 10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

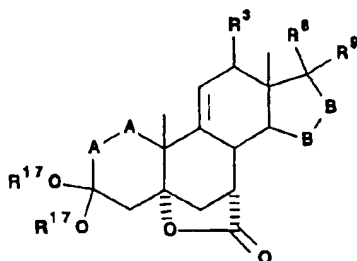
447

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

alkylating a compound of Formula EI by hydrolysis followed by reaction with an alkylating reagent in the presence of a base, the compound of Formula EI having the structure:

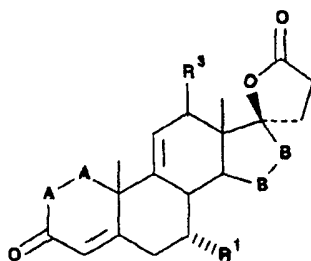


EI

wherein -A-A-, R^3 , R^8 , R^9 and -B-B- are as defined above, and R^{17} is C_1 to C_4 alkyl.

62. A process for the preparation of a compound corresponding to Formula IIC:

448



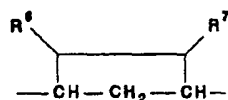
IIC

wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



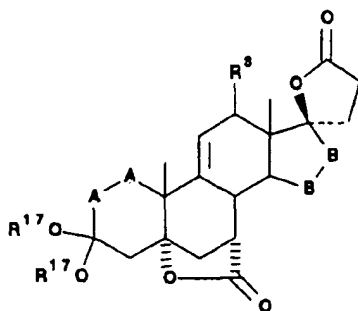
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 alkylating a compound of Formula E by hydrolysis followed by reaction with an alkylating reagent in the presence of a base, the compound of Formula E having the structure:

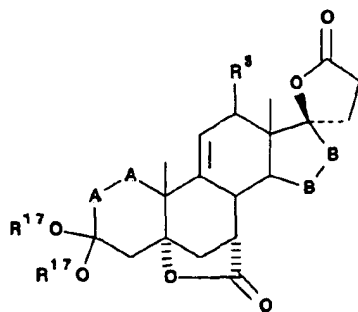
449



E

wherein -A-A-, -B-B- and R^3 are as defined above, and R^{17} is C_1 to C_4 alkyl.

63. A process for the preparation of a compound corresponding to Formula E:



E

wherein

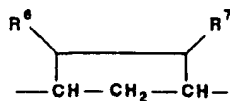
5 -A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{17} is C_1 to C_4 alkyl; and

-B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:

450

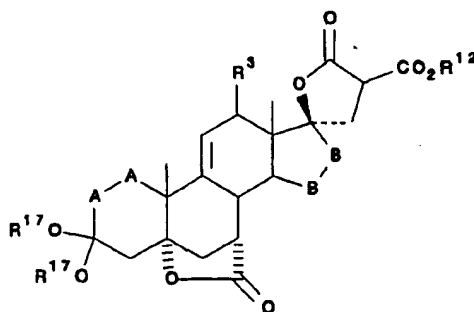


III

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl and cyano and aryloxy;

the process comprising:

- 20 thermally decomposing a compound corresponding to Formula DE2 in the presence of an alkali metal halide, said compound of Formula DE2 having the structure:

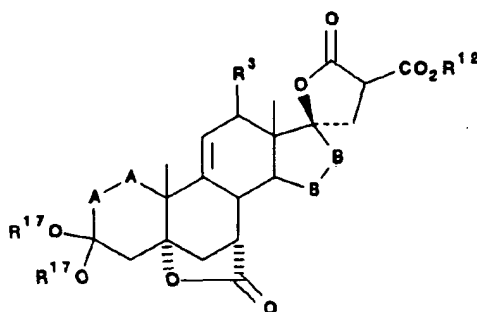


DE2

- 25 wherein R¹² is C₁ to C₄ alkyl, and -A-A-, -B-B-, R³ and R¹⁷ are as defined above.

64. A process for the preparation of a compound corresponding to Formula DE2:

451



DE2

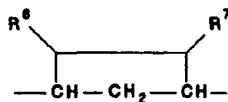
wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

- 10 R¹² and R¹⁷ are independently selected from among C₁ to C₄ alkyl; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



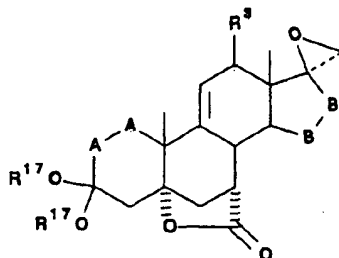
III

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy;

- 20 the process comprising:

452

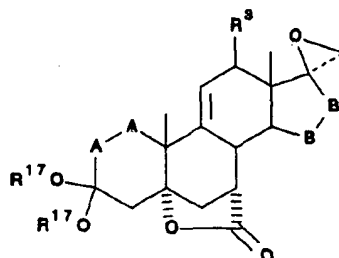
condensing a compound of Formula DE1 with a dialkyl malonate in the presence of a base, said compound of Formula DE1 having the structure:



DE1

25 wherein -A-A-, -B-B-, R^3 and R^{17} are as defined above.

65. A process for the preparation of a compound corresponding to Formula DE1:



DE1

wherein

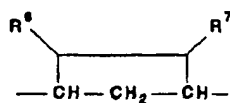
5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{17} is C_1 to C_4 alkyl; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

453

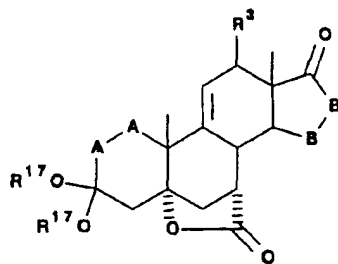


III

- 15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

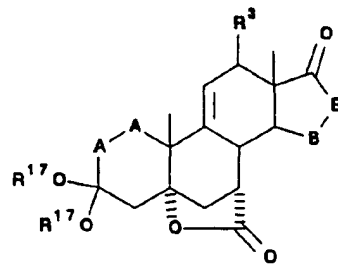
- 20 reacting a compound of Formula D with a sulfonium ylide in the presence of a base, said compound of Formula D having the structure:



D

wherein -A-A-, -B-B-, R^3 are as defined above.

66. A process for the preparation of a compound corresponding to Formula D:



D

wherein

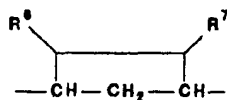
454

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{17} is C_1 to C_4 alkyl; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

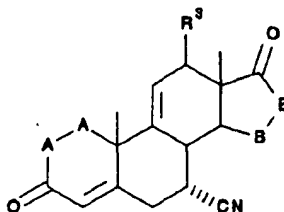


III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 hydrolysis of a compound of Formula C to the 7α -carboxylic acid and reaction under acidic conditions with a trialkyl orthoformate, the compound of Formula C having the structure:

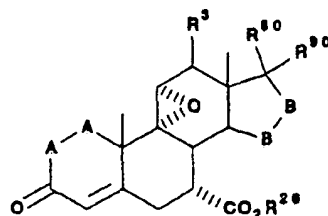


C

25 wherein -A-A-, -B-B- and R^3 are as defined above.

455

67. A process for the preparation of a compound corresponding to Formula I



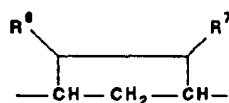
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R²⁶ is C₁ to C₄ alkyl; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxyalkyl, acyloxyalkyl, cyano and aryloxy; and

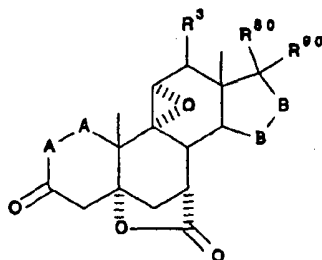
20 R⁸⁰ and R⁹⁰ are independently selected from R⁸ and R⁹, respectively, or R⁸⁰ and R⁹⁰ together form keto;

456

- 25 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

the process comprising:

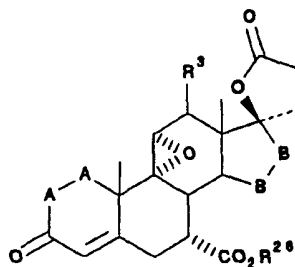
- 30 alkylating a compound of Formula A211 by reaction with an alkylating reagent in the presence of a base, the compound of Formula A211 having the structure:



[A211]

- 35 wherein -A-A-, -B-B-, R^3 , R^{80} and R^{90} are as defined above, and R^{17} is C_1 to C_4 alkyl.

68. A process for the preparation of a compound corresponding to Formula IE:



IE

wherein

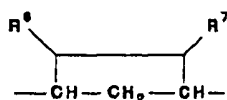
457

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^{26} is C_1 to C_4 alkyl; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

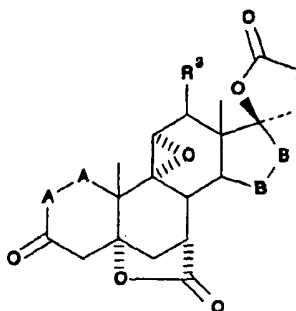


III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

the process comprising:

20 alkylating a compound of Formula 211 by reaction with an alkylating reagent in the presence of a base, the compound of Formula 211 having the structure:

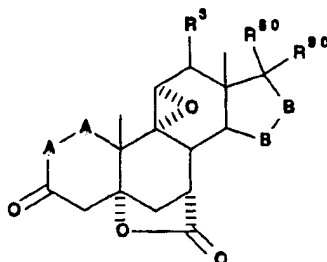


[211]

wherein -A-A-, -B-B- and R^3 are as defined above.

458

69. A process for the preparation of a compound corresponding to Formula 211:



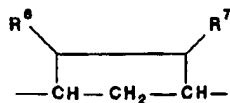
[A211]

wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

R^{80} and R^{90} are independently selected from R^8 and R^9 , respectively or R^{80} and R^{90} together form keto;

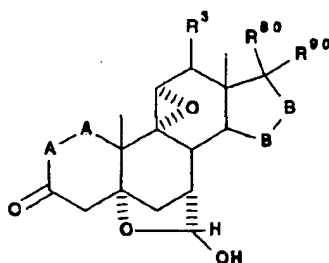
20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

459

alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
 aryloxy, or R^8 and R^9 together comprise a carbocyclic
 25 or heterocyclic ring structure, or R^8 or R^9 together
 with R^6 or R^7 comprise a carbocyclic or heterocyclic
 ring structure fused to the pentacyclic D ring;

the process comprising:

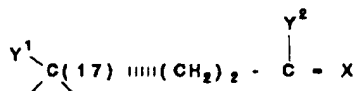
oxidizing a compound of Formula 210, said compound of
 30 Formula 210 having the structure



[A210]

where $-A-A-$, $-B-B-$, R^3 , R^{80} and R^{90} are as defined above.

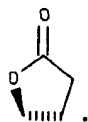
70. A process as set forth in claim 69 wherein R^8
 and R^9 comprise



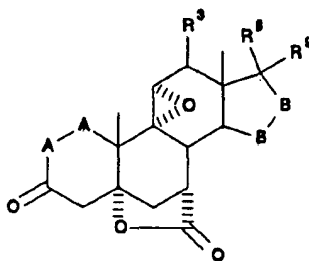
where X represents two hydrogen atoms, oxo or $=S$;
 5 Y^1 and Y^2 together represent the oxygen bridge $-O-$,
 or
 Y^1 represents hydroxy, and
 Y^2 represents hydroxy, lower alkoxy or, if X
 represents H_2 , also lower alkanoyloxy.

71. A process as set forth in claim 70 wherein R^8
 and R^9 comprise

460



72. A process for the preparation of a compound corresponding to the Formula:



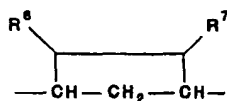
[A211]

wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxyalkyl, acyloxyalkyl, cyano and aryloxy; and

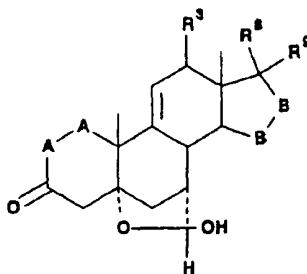
R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy,

461

- 20 acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,
alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy, or R⁸ and R⁹ together comprise a carbocyclic
or heterocyclic ring structure, or R⁸ or R⁹ together
with R⁶ or R⁷ comprise a carbocyclic or heterocyclic
25 ring structure fused to the pentacyclic D ring;

the process comprising:

reacting a 3-keto-5,7-hemiacetal intermediate of Formula
A209 with a peroxide oxidizing reagent, said compound of
Formula A209C corresponding to the formula:

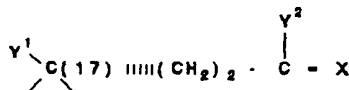


30

[A209C]

wherein -A-A-, -B-B-, R³, R⁸ and R⁹ are as defined above.

73. A process as set forth in claim 72 wherein R⁸
and R⁹ comprise

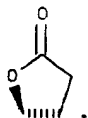


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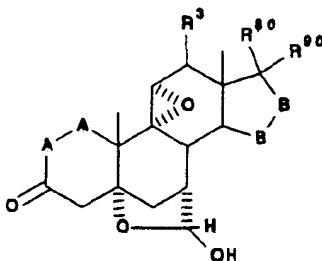
where X represents two hydrogen atoms, oxo or =S;
Y¹ and Y² together represent the oxygen bridge -O-,
or
Y¹ represents hydroxy, and
Y² represents hydroxy, lower alkoxy or, if X
represents H₂, also lower alkanoyloxy.

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74. A process as set forth in claim 73 wherein R^8 and R^9 comprise



75. A process for the preparation of a compound corresponding to the Formula:



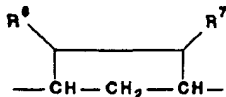
[A210]

wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

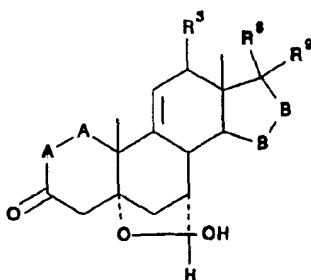
463

R^{80} and R^{90} are independently selected from R^8 and R^9 , respectively, or R^{80} and R^{90} together form keto;

- 20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;
- 25

the process comprising:

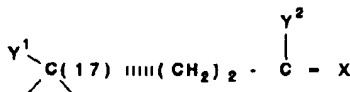
- 30 reacting a 3-keto-5,7-hemiacetal intermediate of Formula A209C with a peroxide oxidizing reagent, said compound of Formula A209C corresponding to the formula:



[A209C]

wherein -A-A-, -B-B-, R^3 , R^8 and R^9 are as defined above.

76. A process as set forth in claim 75 wherein R^8 and R^9 comprise

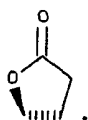


where X represents two hydrogen atoms, oxo or =S;

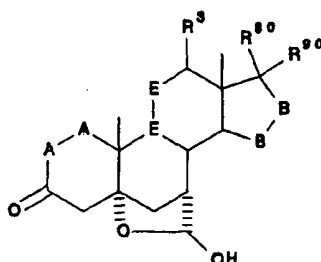
464

- 5 Y^1 and Y^2 together represent the oxygen bridge -O-,
 or
 Y^1 represents hydroxy, and
 Y^2 represents hydroxy, lower alkoxy or, if X
 represents H_2 , also lower alkanoyloxy.

77. A process as set forth in claim 76 wherein R^8
 and R^9 comprise



78. A process for the preparation of a compound
 corresponding to the Formula:

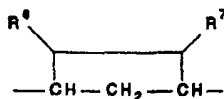


[A209]

wherein

- 5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;
- R^3 is selected from the group consisting of hydrogen,
 halo, hydroxy, lower alkyl, lower alkoxy,
 hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano
 and aryloxy;
- 10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha-
 or beta- oriented group:

465



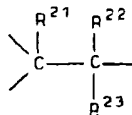
III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

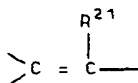
R⁸⁰ and R⁹⁰ are independently selected from R⁸ and R⁹, respectively, or R⁸⁰ and R⁹⁰ together form keto;

20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic
25 or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring;

and -E-E- is selected from among:



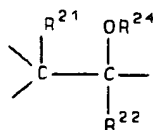
XLIII



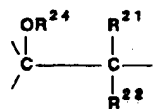
XLIV

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466

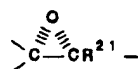


XLV



XLVI

and

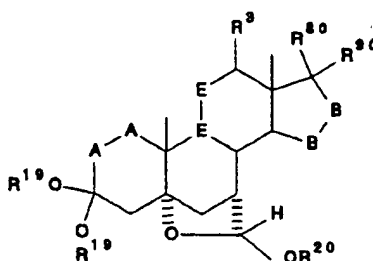


XLVII

- 35 where R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; and R^{24} is selected from among hydrogen and lower alkyl;

the process comprising:

hydrolyzing a compound corresponding to the Formula A208



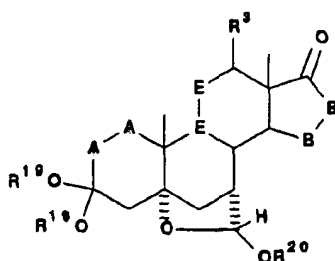
[A208]

40

wherein -A-A-, -B-B-, -E-E-, R^3 , R^{80} and R^{90} are as defined above; R^{19} is C_1 to C_4 alkyl or the $R^{19}O$ - groups together form an O,O-oxyalkylene bridge; and R^{20} is C_1 - C_4 alkyl.

467

79. A process for the preparation of a compound corresponding to Formula:



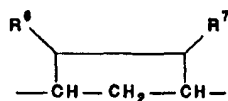
[A205]

wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

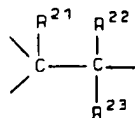
15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

R¹⁹ is C₁ to C₄ alkyl or the R¹⁸O- groups together form an O,O-oxyalkylene bridge; and

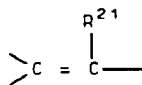
20 R²⁰ is C₁-C₄ alkyl; and

wherein -E-E- is selected from among:

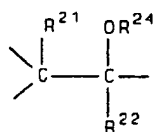
468



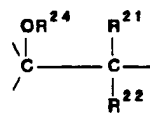
XLIII



XLIV



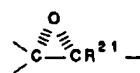
XLV



XLVI

25

and



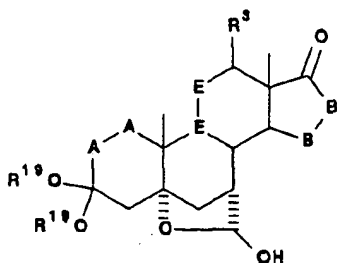
XLVII

where R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; R^{24} is selected
 30 from among hydrogen and lower alkyl;

the process comprising:

469

reacting a compound corresponding to Formula A204 with a lower alcohol and an acid, said compound of Formula A204 having the structure:

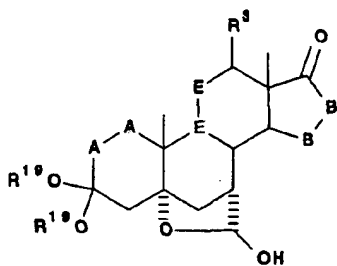


[A204]

35

wherein -A-A-, -B-B-, -E-E-, R^3 , and R^{19} are as defined above.

80. A process for the preparation of a compound corresponding to Formula:



[A204]

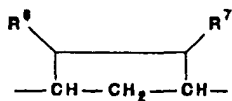
wherein

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

470

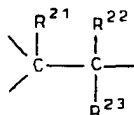


III

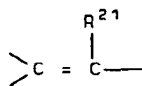
15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R¹⁹ is C₁ to C₄ alkyl or the R¹⁹O- groups together form an O,O-oxyalkylene bridge;

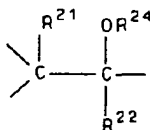
20 wherein -E-E- is selected from among:



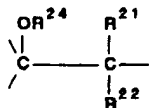
XLIII



XLIV



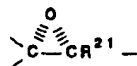
XLV



XLVI

471

25 and



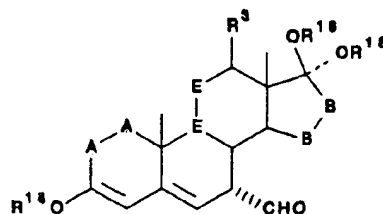
XLVII

where R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; and R^{24} is selected from among hydrogen and lower alkyl;

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the process comprising:

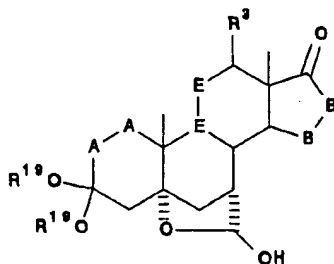
hydrolyzing compound corresponding to Formula A203, said compound of Formula A203 having the structure:



[A203]

35 wherein -A-A-, -B-B-, -E-E- and R^3 are as defined above, and R^{18} is C_1 to C_4 alkyl or the $\text{R}^{18}\text{O}-$ groups together form an O,O-oxyalkylene bridge.

81. A process for the preparation of a compound corresponding to Formula:



[A204]

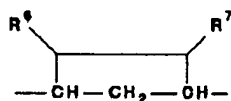
wherein

472

5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

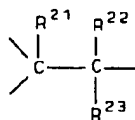


III

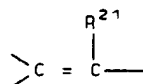
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R^{19} is C_1 to C_4 alkyl or the $\text{R}^{19}\text{O}-$ groups together form an O,O-oxyalkylene bridge; and

20 wherein -E-E- is selected from among:

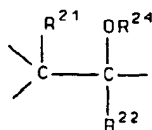


XLIII

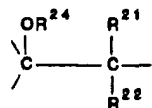


XLIV

473

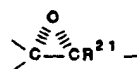


XLV



XLVI

25 and

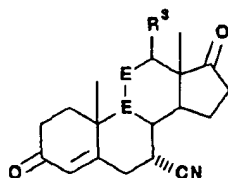


XLVII

where R^{18} is C_1 to C_4 alkyl or the $R^{18}O-$ groups together
 form an O,O-oxyalkylene bridge; R^{21} , R^{22} and R^{23} are
 independently selected from among hydrogen, alkyl, halo,
 30 nitro, and cyano; and R^{24} is selected from among hydrogen
 and lower alkyl;

the process comprising:

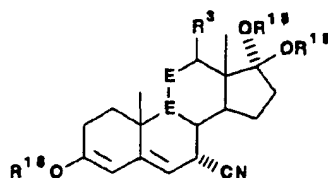
protecting the keto substituents of a compound
 35 corresponding to Formula A201 by reaction with alkanol
 under acid condition in the presence of orthoformate,
 said compound of Formula A201 having the structure:



[A201]

474

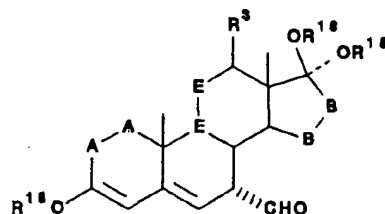
wherein -A-A-, -B-B-, -E-E- and R^3 , are as defined above,
 40 thereby producing a 3-enol ether intermediate
 corresponding to Formula A202:



[A202]

wherein -A-A-, -B-B-, -E-E- and R^3 are as defined above,
 and R^{18} is C_1 to C_4 alkyl or the $R^{18}O$ - groups together form
 45 an O,O-oxyalkylene bridge; and
 reducing said compound of Formula A202.

82. A process for the preparation of a compound
 corresponding to the formula:



[A203]

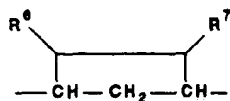
wherein

5 -A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

R^3 is selected from the group consisting of hydrogen,
 halo, hydroxy, lower alkyl, lower alkoxy,
 hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano
 and aryloxy;

10 -B-B- represents the group $-CHR^6-CHR^7-$ or an alpha-
 or beta- oriented group:

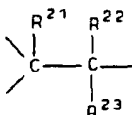
475



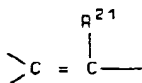
III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

wherein -E-E- is selected from among:

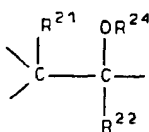


XLIII

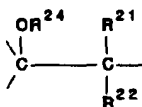


20

XLIV

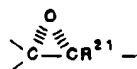


XLV



XLVI

and



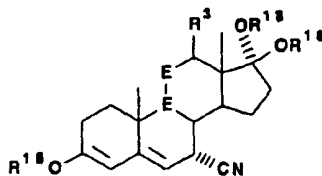
XLVII

25 where R¹⁸ is C₁ to C₄ alkyl or the R¹⁸O- groups at C-17 together form an O,O-oxyalkylene bridge; R²¹, R²² and R²³ are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; and R²⁴ is selected from among hydrogen and lower alkyl;

30 the process comprising:

476

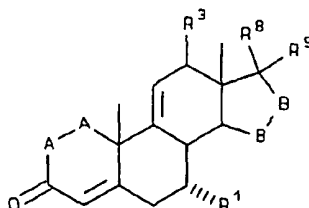
reducing a compound corresponding to Formula A202:



[A202]

wherein -A-A-, -B-B-, -E-E-, R^3 , and R^{18} are as defined above.

83. A process for the preparation of a compound corresponding to Formula II:



II

wherein:

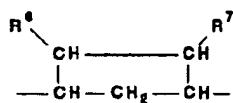
5 -A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R^1 represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

477

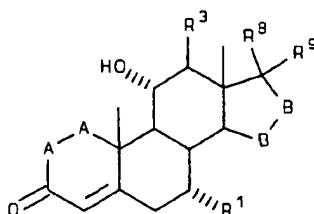


III

- 15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and
- 20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic
- 25 or heterocyclic ring structure;

the process comprising:

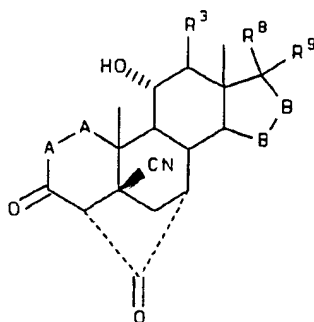
preparing a compound of Formula V



V

- wherein -A-A-, R¹, -B-B-, R³, R⁸ and R⁹ are as defined
- 30 above, by reacting a compound of Formula VI with an alkali metal alkoxide corresponding to the formula R¹⁰OM wherein M is an alkali metal and R¹⁰O- corresponds to the alkoxy substituent of R¹, said compound of Formula VI having the structure:

478



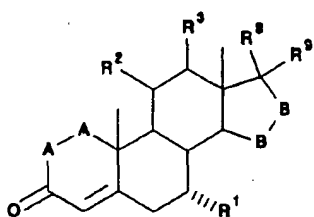
VI

35

wherein -A-A-, -B-B-, R^3 , R^8 and R^9 are as defined above;

without isolating said compound of Formula V in purified form, reacting said compound of Formula V with a lower alkylsulfonylating or acylating reagent to produce a compound of Formula IV

40



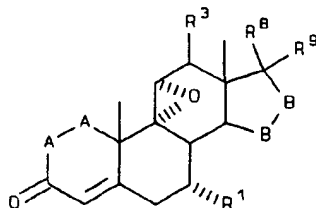
IV

wherein -A-A-, -B-B-, R^1 , R^3 , R^8 and R^9 are as defined above, and R^2 is alkylsulfonyloxy, acyloxy leaving group or halide;

45 without isolating said compound of Formula IV in purified form, removing the 11α -leaving group therefrom by reaction with a reagent for abstraction thereof to produce said compound of Formula II.

84. A process as set forth in claim 83 wherein, without isolating said compound of Formula II in purified form, said compound of Formula II is reacted with an epoxidizing reagent to form a product of Formula I

479



I

wherein -A-A-, -B-B-, R^1 , R^3 , R^8 and R^9 are as in claim 83.

85. A process as set forth in claim 84 wherein:

said compound of Formula II is formed by reaction of said compound of Formula IV with a leaving group removing reagent comprising an alkanolic acid in the presence of an alkali metal alkoxide;

volatile components are stripped from the reaction solution;

water-soluble components of the reaction solution are removed by washing with an aqueous washing solution, thereby producing a residual Formula II solution suitable for conversion of the compound of Formula II to a compound of Formula I; and

a peroxide oxidizing agent is combined with the residual Formula II solution to effect the conversion of the compound of Formula II to the compound of Formula I.

86. A process as set forth in claim 84 wherein:

said compound of Formula V is formed by reaction of said compound of Formula VI with an alkali metal alkoxide in an organic solvent, thereby producing a Formula V reaction solution;

the compound of Formula V is extracted from a solution comprising the Formula V reaction solution using an organic solvent, thereby producing a Formula V extract solution; and

- 10 a lower alkylsulfonyl halide or acyl halide is introduced into a solution comprising said Formula V extract solution for preparation of the compound of Formula VI.

87. A process as set forth in claim 84 wherein:

said compound of Formula IV is formed by reaction of said compound of Formula V with a leaving group abstraction reagent in an organic solvent, thereby producing a

- 5 Formula IV reaction solution;

a solution comprising the Formula IV reaction solution is passed over an acidic and then a basic exchange resin column for the removal of basic and acidic impurities therefrom, thereby producing a Formula IV eluate

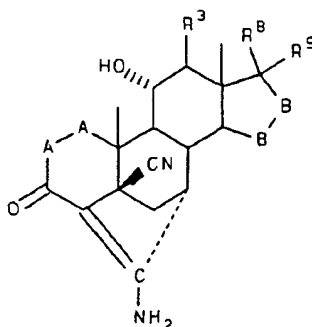
- 10 solution; and

a reagent for abstraction of an alkylsulfonyloxy or acyloxy leaving group is combined with a solution comprising said Formula IV eluate solution for preparation of said compound of Formula II.

88. A process as set forth in claim 83, wherein:

said compound of Formula VI is formed by hydrolyzing a compound corresponding to Formula VII:

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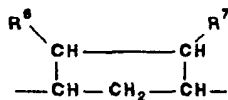
VII

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

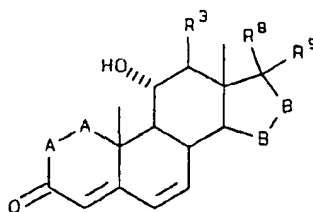
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

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alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

89. A process as set forth in claim 88 wherein:
 said compound of Formula VII is formed by reacting a compound of Formula VIII with a source of cyanide ion in the presence of an alkali metal salt,
 said compound of Formula VIII having the structure:



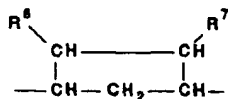
VIII

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

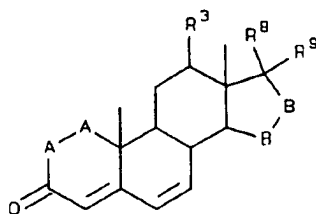
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

90. A process as set forth in claim 89, wherein:
said compound of Formula VIII is formed by oxidizing a substrate compound corresponding to Formula X by fermentation in the presence of a microorganism effective for introducing an 11-hydroxy group into said substrate in α -orientation,

said substrate corresponding to the formula:



XIII

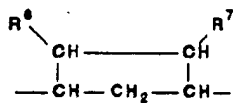
wherein

-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:

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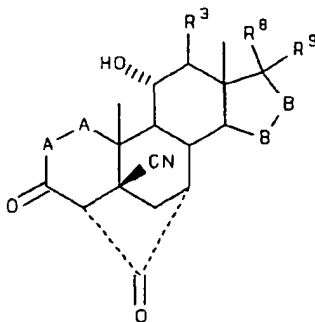


III

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 and R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

91. A process for the preparation of a compound corresponding to Formula VI:



VI

wherein:

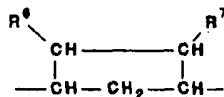
-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower

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alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



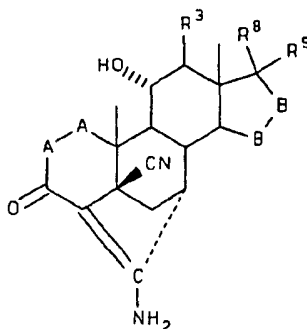
III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure;

the process comprising:

preparing a compound of Formula VII



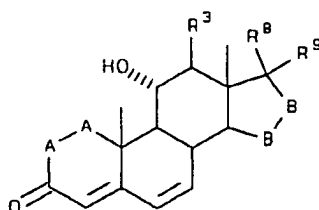
VII

25

wherein -A-A-, -B-B-, R³, R⁸ and R⁹ are as defined above, by reacting a compound of Formula VIII with a source of

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cyanide ion in the presence of an alkali metal salt, said compound of Formula VIII having the structure:

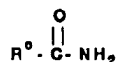


VIII

wherein -A-A-, -B-B-, R³, R⁸ and R⁹ are as defined above;

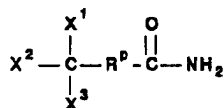
without isolating said compound of Formula VII in purified form, hydrolyzing said compound of Formula VII in the presence of an acid and an organic solvent and/or water, wherein -A-A-, -B-B-, R³, R⁸ and R⁹ are as defined above, to produce said compound of Formula VI.

92. A process for the formation of an epoxy compound comprising contacting a substrate compound having an olefinic double bond with a peroxide compound in the presence of a peroxide activator, said peroxide activator corresponding to the formula:



where R⁰ is a substituent having an electron withdrawing strength not less than that of monochloromethyl.

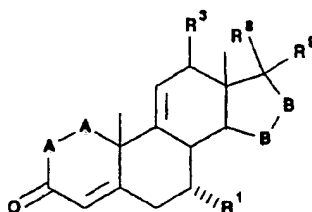
93. A process as set forth in claim 91 wherein said peroxide activator corresponds to the formula



wherein

- 5 R^p is selected from the group consisting of arylene, alkenyl, alkynyl and -(CX⁴X⁵)_n-;
- X¹, X², X³, X⁴ and X⁵ are independently selected from among halo, hydrogen, alkyl, haloalkyl and cyano and cyanoalkyl; and
- 10 n is 0, 1 or 2;
- provided that when n is 0, then at least one of X¹, X² and X³ is halo; and
- when R^p is -(CX⁴X⁵)_n- and n is 1 or 2, then at least one of X⁴ and X⁵ is halo.
- 15 94. A process as set forth in claim 92 wherein n is 0 and at least two of X¹, X² and X³ are halo or perhaloalkyl.
95. A process as set forth in claim 92 wherein all of X¹, X², X³, X⁴ and X⁵ are halo or perhaloalkyl.
- 20 96. A process as set forth in claim 91 wherein said peroxide activator is a trihaloacetamide.
97. A process as set forth in claim 95 wherein said peroxide activator is trichloroacetamide.
98. A process as set forth in claim 91 wherein said
- 25 peroxide activator is selected from the group consisting of chlorodifluoroacetamide and heptafluorobutyramide.
99. A process as set forth in claim 91 wherein said substrate compound corresponds to the Formula:

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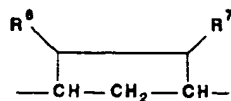
wherein

5 -A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxy carbonyl, cyano and aryloxy;

10 R¹ represents an alpha-oriented lower alkoxy carbonyl or hydroxycarbonyl radical;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

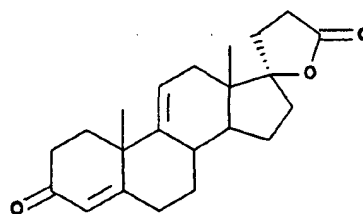
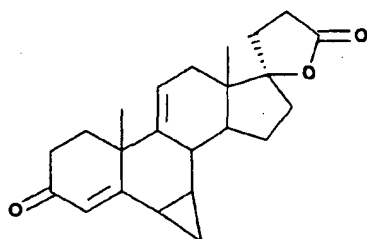
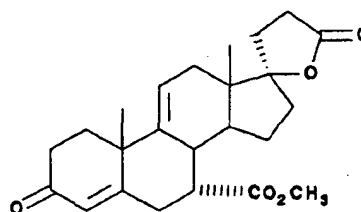
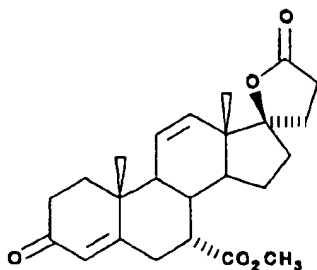
20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together

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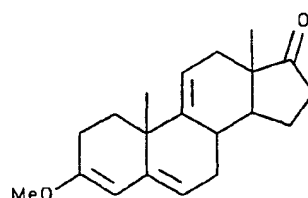
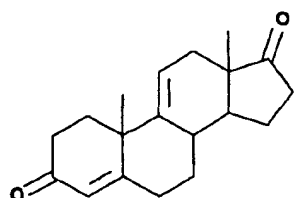
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with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

100. A process as set forth in claim 91 wherein said substrate compound is selected from the group consisting of:

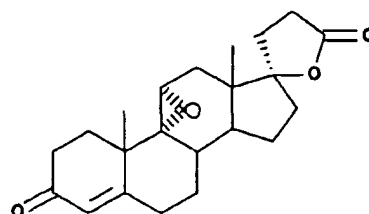
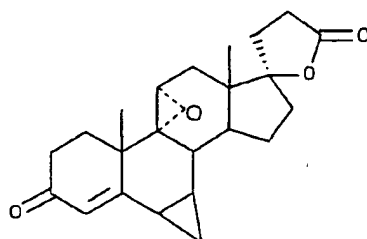
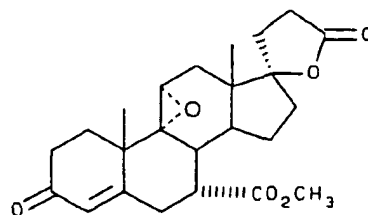
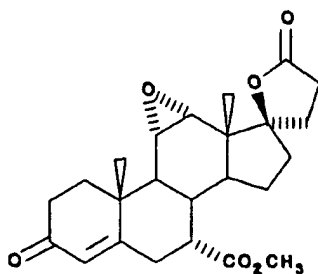


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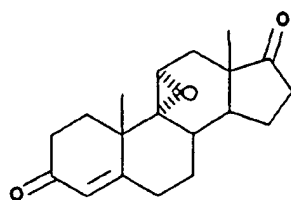


and a product of the epoxidation reaction is selected from the group consisting of:

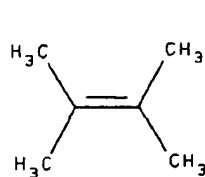
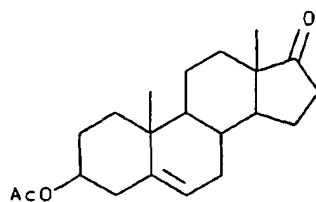
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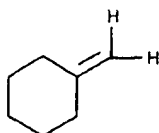
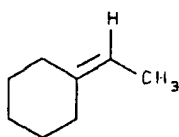
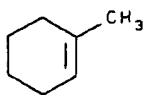


101. A process as set forth in claim 91 wherein said substrate compound is selected from the group consisting of:

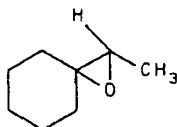
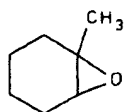
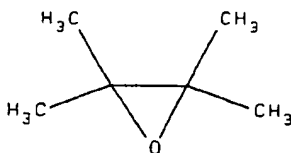
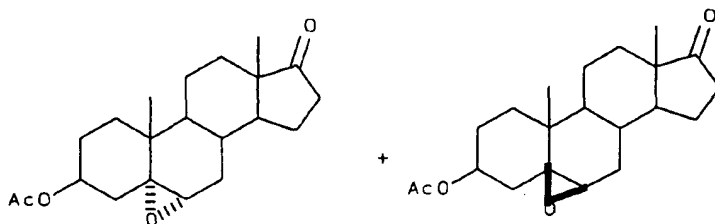


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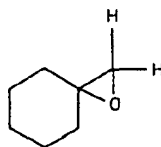
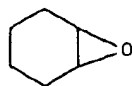
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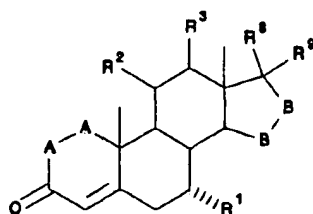
10 and a product of the epoxidation reaction is selected from the group consisting of:



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102. A compound of Formula IV:



IV

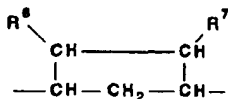
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxy carbonyl, cyano and aryloxy;

R^1 represents an alpha-oriented lower alkoxy carbonyl or hydroxycarbonyl radical;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

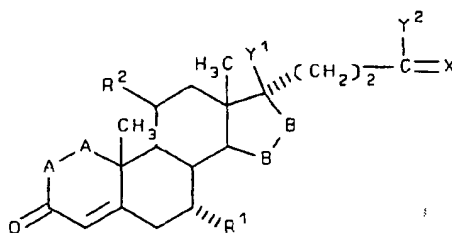
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where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring; and

R² is lower alkylsulfonyloxy or acyloxy or a halide.

103. A compound of Formula IV as set forth in claim 101 wherein said compound corresponds to Formula IVAA:



IVAA

wherein:

-A-A- represents the group -CH₂-CH₂- or -CH=CH-;

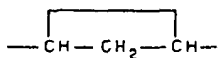
R¹ represents an alpha-oriented lower alkoxycarbonyl radical;

R² represents lower alkylsulfonyloxy or acyloxy;

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-B-B- represents the group $-\text{CH}_2-\text{CH}_2-$ or an alpha- or beta- oriented group:

10



IIIA

X represents two hydrogen atoms or oxo;

Y^1 and Y^2 together represent the oxygen bridge $-\text{O}-$,
or

Y^1 represents hydroxy, and

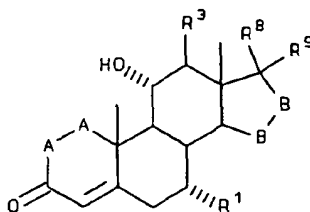
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Y^2 represents hydroxy, lower alkoxy or, if X represents H_2 , also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y^2 represents hydroxy.

104. A compound of Formula IV as set forth in claim 101 wherein said compound is Methyl Hydrogen 17α -Hydroxy- 11α -(methylsulfonyl)oxy-3-oxopregn-4-ene- $7\alpha,21$ -dicarboxylate, γ -Lactone.

105. A compound of Formula V:



V

wherein

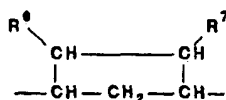
-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

495

5 R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R¹ represents an alpha-oriented lower alkoxycarbonyl or hydroxycarbonyl radical;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



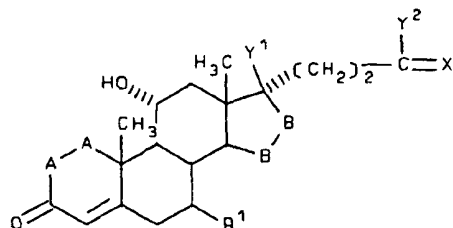
III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic
25 ring structure fused to the pentacyclic D ring.

106. A compound of Formula V as set forth in claim
104 wherein the compound corresponds to the formula:

496



VAA

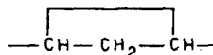
wherein

5 -A-A- represents the group -CH₂-CH₂- or -CH=CH-;

R¹ represents an alpha-oriented lower alkoxy carbonyl radical;

-B-B- represents the group -CH₂-CH₂- or an alpha- or beta- oriented group:

10



IIIA

X represents two hydrogen atoms or oxo;

Y¹ and Y² together represent the oxygen bridge -O-,
or

Y¹ represents hydroxy, and

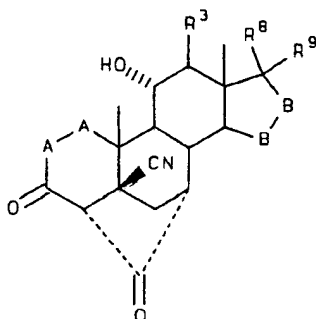
15 Y² represents hydroxy, lower alkoxy or, if X represents H₂, also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y² represents hydroxy.

107. A compound of Formula V as set forth in claim 104 wherein the compound is Methyl Hydrogen 11 α ,17 α -Dihydroxy-3-oxopregn-4-ene-7 α ,21-dicarboxylate, γ -Lactone.

497

108. A compound of Formula VI:



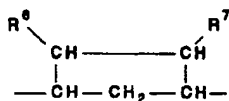
VI

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

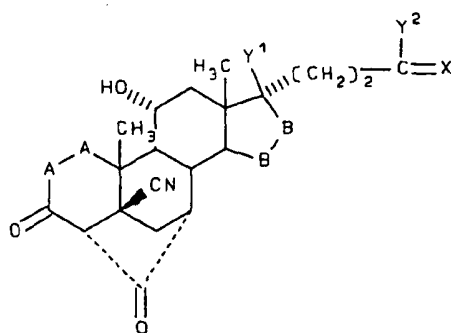
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and

498

aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

109. A compound of Formula VI as set forth in claim 107 wherein said compound corresponds to the formula:

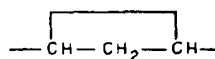


VIAA

wherein:

5 -A-A- represents the group -CH₂-CH₂- or -CH=CH-;

-B-B- represents the group -CH₂-CH₂- or an alpha- or beta- oriented group:



IIIA

X represents two hydrogen atoms or oxo;

10 Y¹ and Y² together represent the oxygen bridge -O-,
or

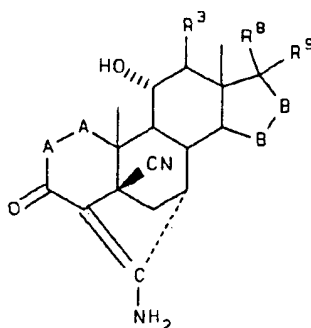
Y¹ represents hydroxy, and

Y² represents hydroxy, lower alkoxy or, if X represents H₂, also lower alkanoyloxy;

15 and salts of compounds in which X represents oxo and Y² represents hydroxy.

110. A compound of Formula VI as set forth in claim 107 wherein said compound is 4'S(4'α),7'α-Hexadecahydro-11'α-hydroxy-10'β,13'β-dimethyl-3',5,20'-trioxospiro [furan-2(3H),17'β-[4,7]methano[17H]cyclopenta[a]phenanthrene]-5'β(2'H)-carbonitrile.

111. A compound of Formula VII:



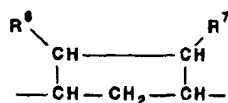
VII

wherein

-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

5 R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



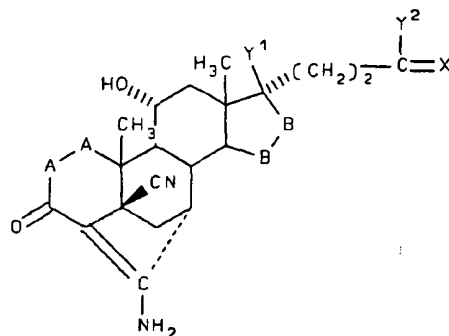
III

500

where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ or R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

112. A compound of Formula VII as set forth in claim 110 wherein said compound corresponds to Formula VIIIA:



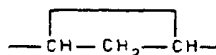
VIIIA

5 wherein:

-A-A- represents the group -CH₂-CH₂- or -CH=CH-;

-B-B- represents the group -CH₂-CH₂- or an alpha- or beta- oriented group:

501



IIIA

10 X represents two hydrogen atoms or oxo;

Y¹ and Y² together represent the oxygen bridge -O-,
or

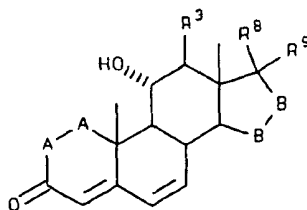
Y¹ represents hydroxy, and

15 Y² represents hydroxy, lower alkoxy or, if X
represents H₂, also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y²
represents hydroxy.

113. A compound of Formula VII as set forth in
claim 110 wherein said compound is 5'R(5'α),7'β-20'-
Amino-hexadecahydro-11'β-hydroxy-10'α,13'α-dimethyl-3',5-
dioxospiro[furan-2(3H),17'α(5'H)-[7,4]metheno[4H]cyclo-
penta[a]phenanthrene]-5'-carbonitrile.

114. A compound of Formula VIII:



VIII

wherein

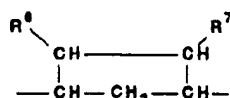
-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

5 R³, R⁴ and R⁵ are independently selected from the
group consisting of hydrogen, halo, hydroxy, lower

502

alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:

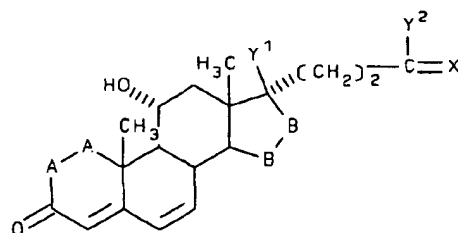


III

15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure, or R⁸ and R⁹ together with R⁶ or R⁷ comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

115. A compound of Formula VIII as set forth in claim 113 wherein said compound corresponds to Formula VIIIAA:



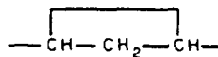
VIIIAA

5 wherein:

503

-A-A- represents the group $-\text{CH}_2-\text{CH}_2-$ or $-\text{CH}=\text{CH}-$;

-B-B- represents the group $-\text{CH}_2-\text{CH}_2-$ or an alpha- or beta- oriented group:



IIIA

10 X represents two hydrogen atoms or oxo;

Y^1 and Y^2 together represent the oxygen bridge $-\text{O}-$,
or

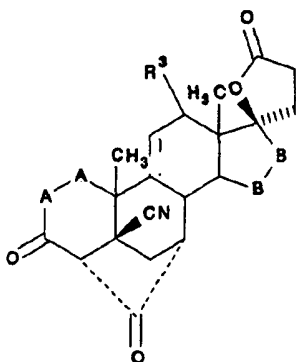
Y^1 represents hydroxy, and

15 Y^2 represents hydroxy, lower alkoxy or, if X
represents H_2 , also lower alkanoyloxy;

and salts of compounds in which X represents oxo and Y^2
represents hydroxy.

116. A compound of Formula VIII as set forth in
claim 113 wherein said compound is $11\alpha, 17\alpha$ -Dihydroxy-3-
oxopregna-4,6-diene-21-carboxylic Acid, γ -Lactone.

117. A compound of Formula XIVB:



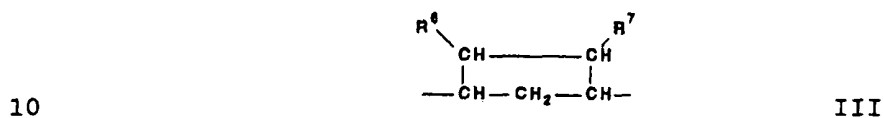
XIVB

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

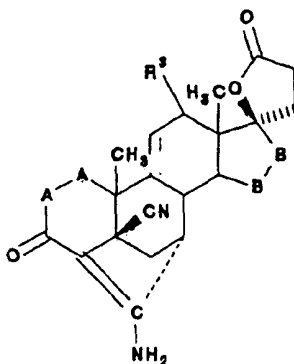


15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy.

118. A compound of Formula XIVB as set forth in claim 116 wherein said compound is 4'S(4'α),7'α-1',2',3',4,4',5,5', 6',7',8',10',12',13',14',15',16'-hexadecahydro-10β-,13'β-dimethyl-3',5,20'-trioxospiro[furan-2(3H),17'β-[4,7]methano-
5 [17H]cyclopenta[a]phenanthrene]5'-carbonitrile.

119. A compound corresponding to Formula XVB:

505



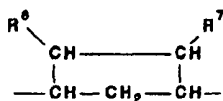
XVB

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

10

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and

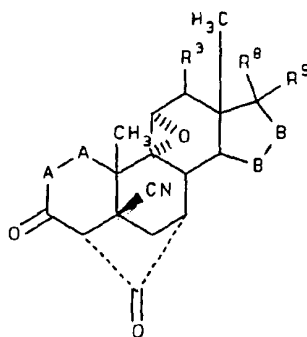
15 aryloxy.

120. A compound of Formula XVB as set forth in claim 118 wherein said compound is 5'R(5' α), 7' β -20'-amino-1', 2', 3', 4, 5, 6', 7', 8', 10', 12', 13', 14', 15', 16'-tetradecahydro-10' α , 13' α -dimethyl-3', 5-dioxospiro[furan-

506

2(3H),17' α (5'H) - [7,4]metheno[4H] -
 5 cyclopenta[a]phenanthrene] -5' -carbonitrile.

121. A compound corresponding to Formula XXI:



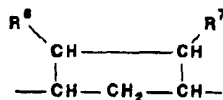
XXI

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

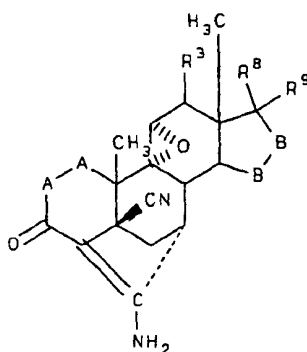
10

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and
 15 aryloxy

507

122. A compound of Formula XXI as set forth in claim 120 wherein said compound is 4'S(4'α),7'α-9',11α-epoxyhexadecahydro-10β-,13'β-dimethyl-3'5,20'-trioxospiro [furan-2(3H),17'β-[4,7]methano [17H]cyclopenta[a]phenanthrene-5'-carbonitrile.

123. A compound corresponding to Formula XXII:



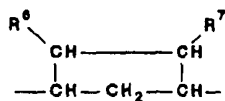
XXII

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R_3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

10

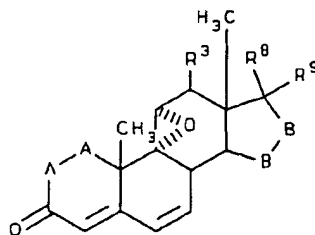
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

508

15 alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy.

124. A compound of Formula XXII as set forth in
claim 122 wherein said compound is 5'R(5' α),7' β -20'-
amino9,11 β -epoxyhexadecahydro-10',13'-dimethyl-3',5-
5 dioxospiro[furan-2(3H),17'a(5'H) - [7,4]methene[4H]
cyclopenta[a]phenanthrene-5'-carbonitrile.

125. A compound corresponding to Formula XXIII:



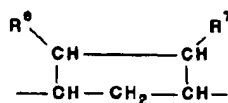
XXIII

wherein

-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

5 R³, R⁴ and R⁵ are independently selected from the
group consisting of hydrogen, halo, hydroxy, lower
alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl,
hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group -CHR⁶-CHR⁷- or an alpha-
or beta-oriented group:



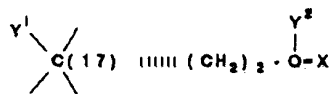
III

where R⁶ and R⁷ are independently selected from the
group consisting of hydrogen, halo, lower alkoxy,
acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

509

- 15 alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
 aryloxy.

126. A compound of Formula XXIII as set forth in
 claim 124 wherein R⁸ and R⁹ together with the ring carbon
 to which they are attached form the structure:



XXXIV

5 where

X represents two hydrogen atoms or oxo;

Y¹ and Y² together represent the oxygen bridge -O-,

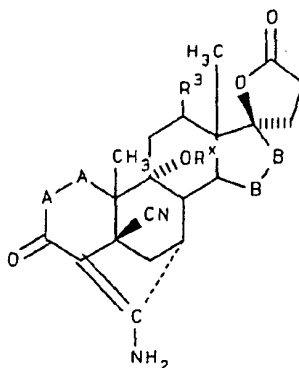
or

Y¹ represents hydroxy, and

10 Y² represents hydroxy, lower alkoxy or, if X
 represents H₂, also lower alkanoyloxy;

and salts of such compounds in which X represents
 oxo and Y² represents hydroxy.

127. A compound corresponding to Formula XXV:



XXV

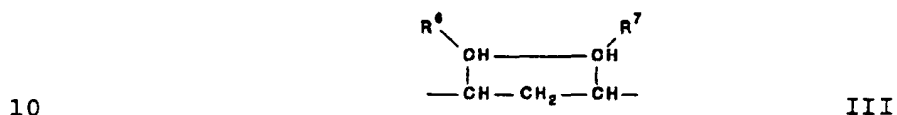
wherein

-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

510

5 R³, R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:



15 where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

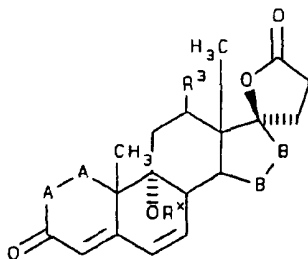
20 R⁸ and R⁹ are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R⁸ and R⁹ together comprise a carbocyclic or heterocyclic ring structure; and

R^{*} is selected from the group consisting of hydrogen or a hydroxy protecting group.

5 128. A compound of Formula XXV as set forth in claim 126 wherein said compound is 5'R(5'α),7'β-20'-aminohexadecahydro-9'β-hydroxy-10'a,13'α-dimethyl-3',5-dioxospiro[furan-2(3H),17'α(5'H)-[7,4]metheno[4H]cyclopenta[a]phenanthrene]-5'-carbonitrile.

129. A compound corresponding to Formula XXVI:

511



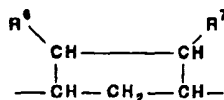
XXVI

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

10

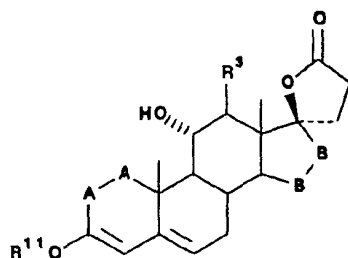
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
15 aryloxy; and

R^* is selected from the group consisting of hydrogen or a hydroxy protecting group.

130. A compound of Formula XXVI as set forth in claim 128 wherein said compound is $9\alpha,17\alpha$ -dihydroxy-3-oxopregna-4,6-diene-21-carboxylic acid, γ -lactone.

512

131. A compound corresponding to Formula 104:



104

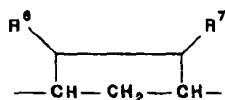
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R^{11} is C_1 to C_4 lower alkyl; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



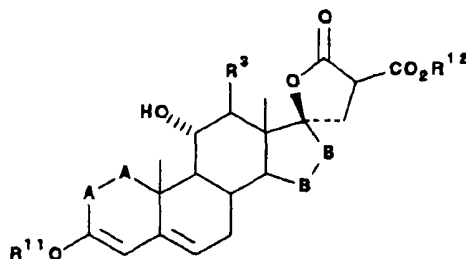
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy.

132. A compound of Formula 104 as set forth in claim 130 wherein said compound is 3-ethoxy-11 α -17 α -dihydroxy-pregna-3,5-diene-21-carboxylic acid, gamma-lactone.

513

133. A compound corresponding to Formula 103:



103

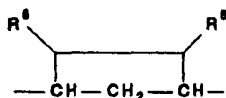
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R^{11} is C_1 - C_4 lower alkyl; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



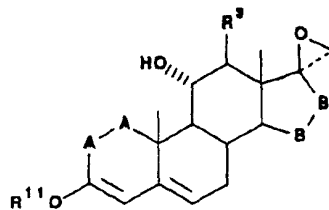
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy.

134. A compound of Formula 103 as set forth in claim 132 wherein said compound is ethyl hydrogen 3-ethoxy-11 α -17 α -dihydroxy-pregna-3,5-diene-21,21-dicarboxylate, gamma-lactone.

514

135. A compound corresponding to Formula 102:



102

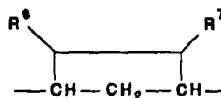
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R^{11} is C_1 to C_4 alkyl; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



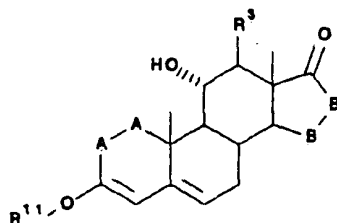
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy

136. A compound of Formula 102 as set forth in claim 134 wherein said compound is 3-ethoxyspiro[androst-3,5-diene-17 β ,2'-oxiran]-11 α -ol.

137. A compound corresponding to Formula 101:

515



101

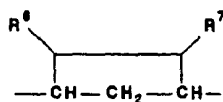
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

- 5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R^{11} is C_1-C_4 alkyl; and

- 10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



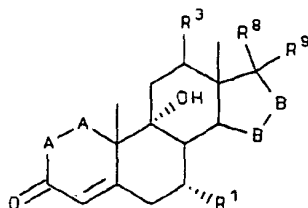
III

- 15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy.

138. A compound of Formula 102 as set forth in claim 136 wherein said compound is 3-ethoxy-11 α -hydroxyandrost-3,5-dien-17-one.

139. A compound of Formula IX:

516



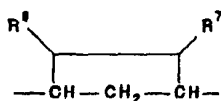
IX

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$,

5 R^3 , R^4 and R^5 are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



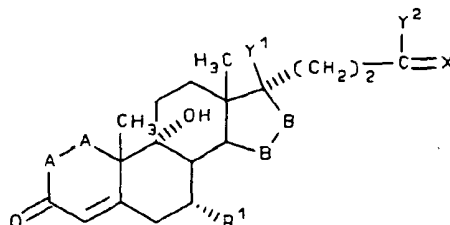
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

517

140. A compound of Formula IX as set forth in claim 138 wherein said compound corresponds to Formula IXAA:



IXAA

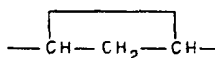
wherein:

5 -A-A- represents the group -CH₂-CH₂- or -CH=CH-;

R⁴ and R⁵ are independently selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 R¹ represents an alpha-oriented lower alkoxycarbonyl radical; and

-B-B- represents the group -CH₂-CH₂- or an alpha- or beta- oriented group:



IIIA

15 X represents two hydrogen atoms or oxo;

Y¹ and Y² together represent the oxygen bridge -O-,
or

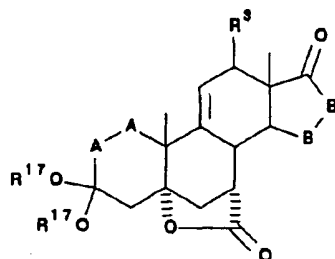
Y¹ represents hydroxy, and

20 Y² represents hydroxy, lower alkoxy or, if X represents H₂, also lower alkanoyloxy;

518

and salts of compounds in which X represents oxo and Y² represents hydroxy.

141. A compound corresponding to Formula D:



D

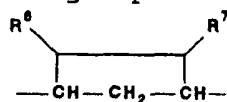
wherein

-A-A- represents the group -CHR⁴-CHR⁵- or -CR⁴=CR⁵-;

R³ is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R¹⁷ is C₁ to C₄ alkyl; and

-B-B- represents the group -CHR⁶-CHR⁷- or an alpha- or beta- oriented group:

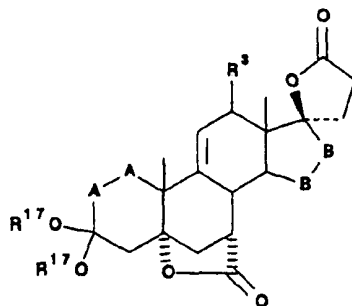


III

where R⁶ and R⁷ are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy.

142. A compound corresponding to Formula E:

519



E

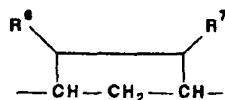
wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

R^{17} is C_1 to C_4 alkyl; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

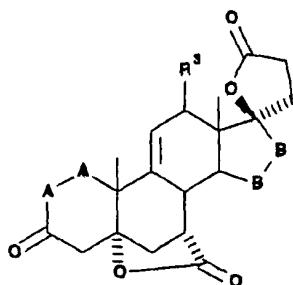


III

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy.

143. A compound corresponding to Formula F:

520



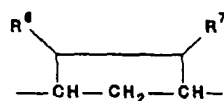
F

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:

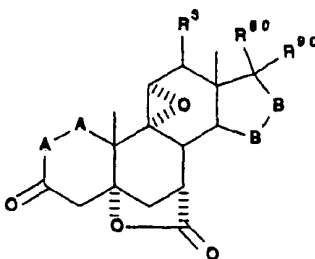


III

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy.

144. A compound corresponding to Formula 211:

521



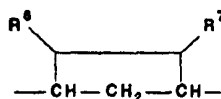
[211]

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

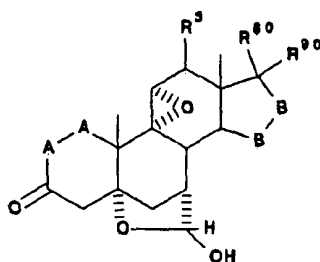
R^{80} and R^{90} are independently selected from R^8 and R^9 , respectively or R^{80} and R^{90} together form keto; and

20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic

522

25 or heterocyclic ring structure, or R^8 or R^9 together with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

145. A compound corresponding to Formula 210:



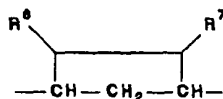
[210]

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

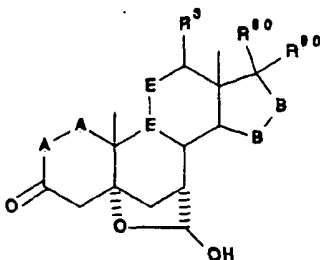
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

R^{80} and R^{90} are independently selected from R^8 and R^9 , respectively, or R^{80} and R^{90} together form keto; and

523

20 R^8 and R^9 are independently selected from the group consisting of hydrogen, hydroxy, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy, or R^8 and R^9 together comprise a carbocyclic or heterocyclic ring structure, or R^8 or R^9 together
25 with R^6 or R^7 comprise a carbocyclic or heterocyclic ring structure fused to the pentacyclic D ring.

146. A compound corresponding to Formula 209:



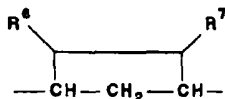
[209]

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy; and

-B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

10

where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

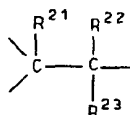
524

15 alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy;

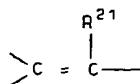
R^{80} and R^{90} are independently selected from R^8 and R^9 ,
respectively, or R^{80} and R^{90} together form keto;

20 R^8 and R^9 are independently selected from the group
consisting of hydrogen, hydroxy, halo, lower alkoxy,
acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,
alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and
aryloxy, or R^8 and R^9 together comprise a carbocyclic
or heterocyclic ring structure, or R^8 or R^9 together
with R^6 or R^7 comprise a carbocyclic or heterocyclic
25 ring structure fused to the pentacyclic D ring; and

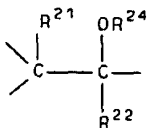
-E-E- is selected from among:



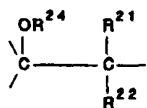
XLIII



XLIV



XLV

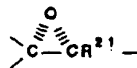


XLVI

30

525

and

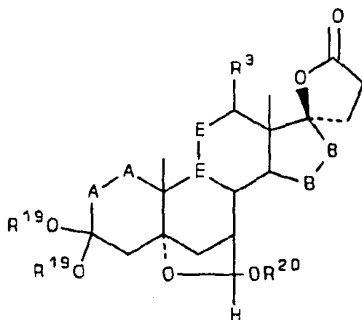


XLVII

where R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; and

35 R^{24} is selected from among hydrogen and lower alkyl.

147. A compound corresponding to Formula 208:



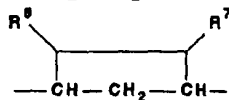
[208]

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



III

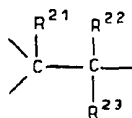
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy,

526

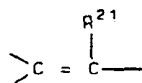
- 15 acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

R^{20} is C_1 - C_4 alkyl; and

-E-E- is selected from among:

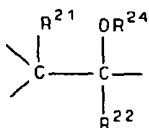


XLIII

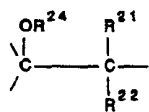


20

XLIV

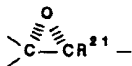


XLV



XLVI

and



XLVII

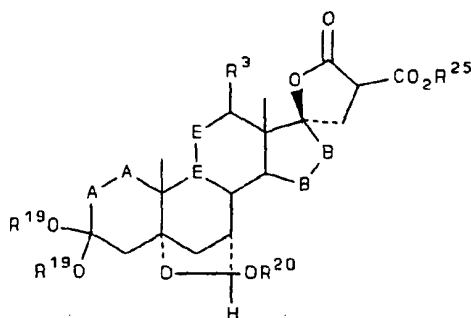
527

25 where R^{19} is C_1 to C_4 alkyl or the $R^{18}O$ - groups together form an O,O-oxyalkylene bridge;

R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano; and

R^{24} is selected from among hydrogen and lower alkyl.

148. A compound corresponding to Formula 207:



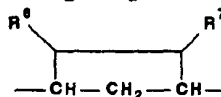
[207]

wherein

-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:



III

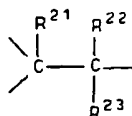
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl,

528

- 15 alkyl, alkoxy carbonyl, acyloxyalkyl, cyano and aryloxy; and

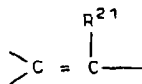
R^{20} is C_1 - C_4 alkyl; and

-E-E- is selected from among:

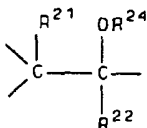


XLIII

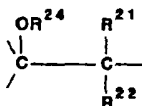
20



XLIV

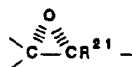


XLV



XLVI

and



XLVII

529

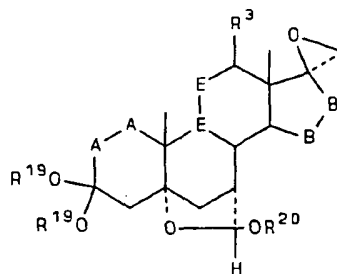
25 where R^{19} is C_1 to C_4 alkyl or the $R^{18}O$ - groups together form an O,O-oxyalkylene bridge;

R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano;

30 R^{24} is selected from among hydrogen and lower alkyl; and

R^{25} is C_1 to C_4 alkyl.

149. A compound corresponding to Formula 206:



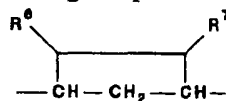
[206]

wherein

-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:



III

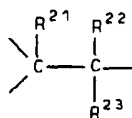
where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy,

530

- 15 acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy;

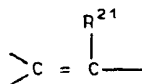
R^{20} is C_1 - C_4 alkyl; and

-E-E- is selected from among:

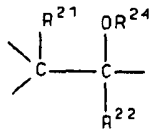


XLIII

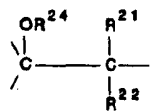
20



XLIV

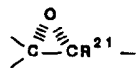


XLV



XLVI

and



XLVII

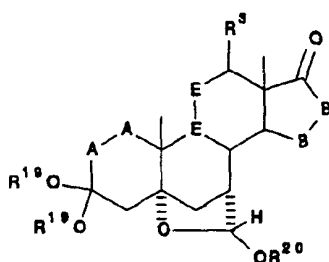
531

25 where R^{19} is C_1 to C_4 alkyl or the $R^{18}O$ - groups together form an O,O-oxyalkylene bridge;

R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano;

R^{24} is selected from among hydrogen and lower alkyl.

150. A compound corresponding to Formula 205:



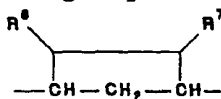
[205]

wherein

-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:



III

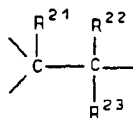
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxycarbonyl, acyloxyalkyl, cyano and aryloxy; and

532

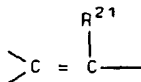
R^{19} and R^{20} are independently selected from C_1 - C_4 alkyl; and

-E-E- is selected from among:

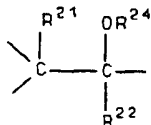
20



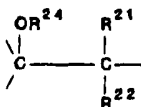
XLIII



XLIV



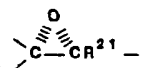
XLV



XLVI

and

25



XLVII

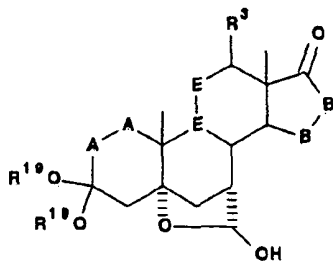
where R^{19} is C_1 to C_4 alkyl or the $R^{19}O$ - groups together form an O,O-oxyalkylene bridge;

533

R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano;

30 R^{24} is selected from among hydrogen and lower alkyl.

151. A compound corresponding to Formula 204:



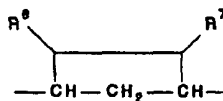
[204]

wherein

-A-A- represents the group $-CHR^4-CHR^5-$ or $-CR^4=CR^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

10 -B-B- represents the group $-CHR^6-CHR^7-$ or an alpha- or beta- oriented group:

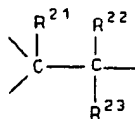


III

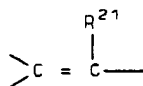
15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxyalkyl, acyloxyalkyl, cyano and aryloxy; and

-E-E- is selected from among:

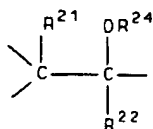
534



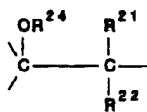
XLIII



XLIV

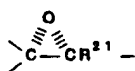


XLV



XLVI

and



XLVII

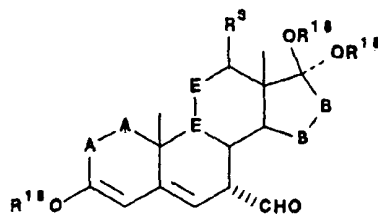
25 where R^{18} is C_1 to C_4 alkyl or the $\text{R}^{18}\text{O}-$ groups together form an O,O-oxyalkylene bridge;

R^{21} , R^{22} and R^{23} are independently selected from among hydrogen, alkyl, halo, nitro, and cyano;

R^{24} is selected from among hydrogen and lower alkyl.

535

152. A compound corresponding to Formula 203:



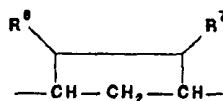
[203]

wherein

-A-A- represents the group $-\text{CHR}^4-\text{CHR}^5-$ or $-\text{CR}^4=\text{CR}^5-$;

5 R^3 is selected from the group consisting of hydrogen, halo, hydroxy, lower alkyl, lower alkoxy, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, cyano and aryloxy;

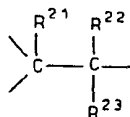
10 -B-B- represents the group $-\text{CHR}^6-\text{CHR}^7-$ or an alpha- or beta- oriented group:



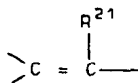
III

15 where R^6 and R^7 are independently selected from the group consisting of hydrogen, halo, lower alkoxy, acyl, hydroxyalkyl, alkoxyalkyl, hydroxycarbonyl, alkyl, alkoxyalkyl, acyloxyalkyl, cyano and aryloxy; and

-E-E- is selected from among:



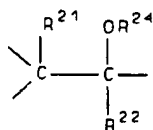
XLIII



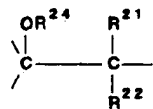
XLIV

536

20

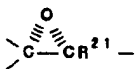


XLV



XLVI

and



XLVII

25

where R¹⁸ is C₁ to C₄ alkyl or the R¹⁸O- groups at C-17 together form an O,O-oxyalkylene bridge;

R²¹, R²² and R²³ are independently selected from among hydrogen, alkyl, halo, nitro, and cyano;

R²⁴ is selected from among hydrogen and lower alkyl.